N.E.L.A. CONVENTION REPORT NUMBER

ELECTRICAL WORLD

McGraw-Hill Publishing Company, Inc.

JUNE 13, 1931
25 cents per copy

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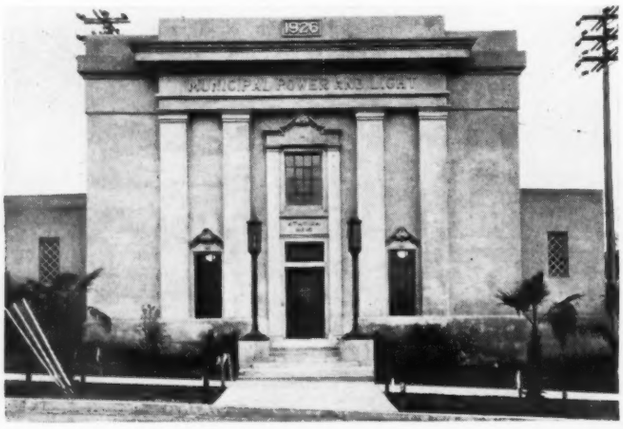
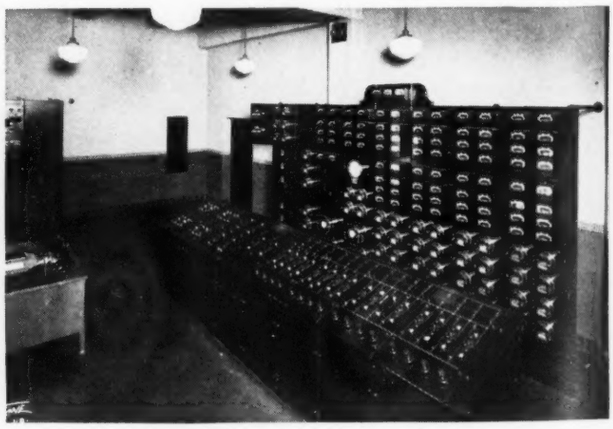


Public Service Bldg.—City of Los Angeles



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WESTON Electrical Instrument Corporation

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Model 496

ELECTRICAL WORLD

A consolidation of Electrical World, Electrical Engineer and American Electrician

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JUNE 13, 1931

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ELECTRICAL WORLD

for the Week Ending

June 13, 1931

N.E.L.A. Annual Convention in Atlantic City

Leaders Emphasize Importance of Public Relations

W. A. JONES
President N. E. L. A.

This is a time when good management comes into its own. Many are crying out now for a new leadership in business. To me this seems to be a futile cry, for leaders are not made overnight. We must look to those men who have piloted our industries through other storms to make the port in this gale. No group of men is better qualified to play an important role and help lead business back to safe ground than those who have proved themselves leaders in the light and power business.

J. F. OWENS
President-elect
N. E. L. A.

There may be a score of reasons for central stations merchandising, but among them I do not find the primary motive as being the retail profit they might enjoy from the sale of equipment. It must always be remembered that complete electric service on the part of the light and power company does not stop with the delivery of electric current at the customer's meter in his cellar. The company has a very important obligation in addition, which is to point to the multitude of uses for that current.

HARRY REID
Chairman
Public Relations National
Section, N. E. L. A.

Building demand means selling equipment, while building capacity means selling securities. Neither can be done without full confidence of the public. Every appliance sold, every security sold represents a transaction between a company and an individual. It is in terms of these millions of human beings that we must consider our future development.

Gruhl Tells of North American Affairs

AFTER acquisition by the North American Company of the Western Power Corporation and its subsequent sale of the latter's three subsidiaries—Great Western Power, San Joaquin Light & Power and Midland Counties Public Service—to the Pacific Gas & Electric had been recounted in last week's Federal Trade Commission hearings, the activities of certain North American financing subsidiaries were outlined. Testimony established that the North American Utilities Securities Corporation and the Edison Securities Corporation had both been organized as virtual departments of the North American Company rather than as separate entities, that their officers received no separate or additional salary for serving them and that no separate staffs of employees were necessitated.

Edwin Gruhl, vice-president and general manager of the North American, then took the stand. The North American Company's policy of paying dividends on common stock in the form of additional common stock rather than in cash was the subject of a considerable part of Mr. Gruhl's testimony. He said the policy had contributed to a constant increasing of the assets of the company. Asked how the company would extricate itself if the time comes when it cannot reinvest earnings, he replied that if the growth of the company were to be stopped there would have to be a change in the stock-dividend policy, perhaps to the cash dividend.

Questioned regarding the company's interest in the North American Light & Power Company, Mr. Gruhl affirmed that North American and Insull interests each own 39.5 per cent of the Light & Power company's voting stock. "The territory served by the principal properties of North American Light & Power Company (those of its subsidiary, Illinois Power & Light Company)," he said, "lie in close proximity to the territories served by the Missouri-Illinois-Iowa subsidiaries of the North American Company and the territories served by the Central and Northern Public Service companies in the Insull group, although no competitive situation exists. It was apparent from our study of the situation that important economies could be achieved through the supply of power from large power plants in both systems. This eliminated duplication of investment in power production facilities and permitted economies due to diversity of load and minimizing of standby requirements. It was also apparent that such savings could be achieved only through a mutual interest of both holding companies rather than the domination by either of them. This is the principal reason underlying the careful preservation of the identity of interests of both parties."

Judge Healy, commission counsel, asked: "Wasn't the effect of division of control to avoid competition between the Insull company and North American Company properties?" Mr. Gruhl affirmed that this was one of the effects.

Counsel then inquired into the sale of public utility properties in California owned through the Western Power Corporation to the Pacific Gas & Electric Company. Mr. Gruhl in reply quoted from a letter to stockholders which said: "Co-ordination of facilities and administration is expected to be of increasing benefit to customers and stockholders and will result in better service to all customers, economies in operation, more efficient uses of existing plant facilities, unification of construction programs to meet future requirements, and the avoidance of future duplication of large capital investment." He said that the two groups were in competition only in a limited part of the territory served by each and had been charging identical rates in the same area.

Judge Healy asked: "Would it be fair to say that the Pacific Gas & Electric Company paid you well to get out of that field?" "I would say," Mr. Gruhl replied, "that the sale was fair to both parties."

At the conclusion of the investigation into the North American Judge Healy announced that the commission had received the full co-operation of the company and that all the accounts and records which the commission had requested were opened to it.

Commissioner McCulloch announced the adjournment of the hearings until June 16, when four Pacific Coast and Western members of the Electric Bond & Share Company group of utilities will be examined. They are the Pacific Power & Light, Northwestern Electric and Inland Power & Light companies, all of Portland, and the Idaho Power Company, Boise.

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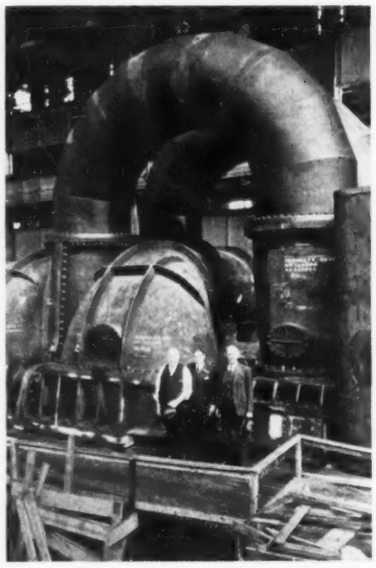
MR. SLOAN VIEWS COMING BROOKLYN TURBINE



With Charles Palmer (left), general foreman General Electric turbine shop at Schenectady, and Oscar Junggren, General Electric consulting engineer, President M. S. Sloan of the Brooklyn Edison Company takes stock of a 160,000-kw. turbine now being assembled for Hudson Avenue. Another one of the same size is under way.

▼

South Carolina Tax on Energy Attacked

CONSTITUTIONALITY OF THE recent South Carolina kilowatt-hour tax on electrical energy (ELECTRICAL WORLD, May 9, page 839) is being attacked by the Lexington Water Power Company and the Broad River Power Company, with headquarters in Columbia. On petition of these companies the United States District Court issued on June 6 to the State Tax Commission a temporary restraining order preventing it from putting the law into effect.

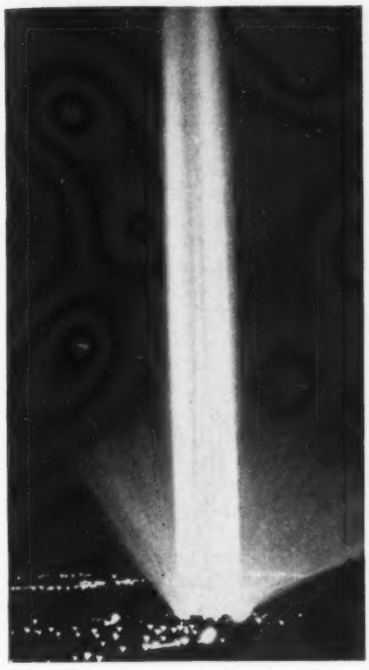
The petitioners allege that the tax of 0.5 mill upon every kilowatt-hour of electricity generated or sold within the state violates both state and federal constitutions and will deprive them of their property without due process of law. The Lexington Water Power Company also attacks the law on the ground that it would constitute an unlawful burden on interstate commerce. The Saluda River plant of the company was constructed and is operated under a license from the Federal Power Commission.

▼

Appalachian Power Begins Suit Over New River Dam

SUIT BY THE Appalachian Electric Power Company has been begun in the United States District Court in Virginia in an effort to have the law creating the Federal Power Commission declared unconstitutional if and in so far as it applies to jurisdiction over non-navigable tributaries to navigable streams. The suit is an outcome of the commission's refusal to grant that company a

THREE-MILE PERPENDICULAR SEARCHLAMP BEAMS



Army men at Fort Shafter, Honolulu, recently projected 24 searchlamp beams more than 15,000 ft. in the air in honor of an inspection visit.

▼

minor-part license for a hydro-electric development on New River near Radford, Va. (ELECTRICAL WORLD, April 11, page 662.) The bill sets out that New River, a tributary of the Kanawha, is not navigable and that the Federal Power Commission in assuming full jurisdiction over it is in conflict with the United States Constitution.

▼

Madison Now Chief Arena for Utility Legislation

WITH EARLY DATES set for the adjournment of the Tennessee, Alabama and Illinois Legislatures, it was not at last advices believed that the bills in any one of those three states drawn to prohibit merchandising of appliances by utility companies were likely to be reached on the calendar, even if in any of the three cases the proposed law emerged from the committee stage.

In Wisconsin, where the outcome cannot be predicted, about a hundred persons attended a hearing on the Slagg anti-merchandising bill last week before the Assembly judiciary committee. George Mooney of Plymouth, representing the Wisconsin Municipal Utilities Association, said the organization disapproved of it unanimously. "The independent retailer is not specialized enough to provide this service," he said. Maunfacturers, contractors and distributors for the power industries also expressed determined opposition. H. W. Story of the Allis-Chalmers Manufacturing Company, Milwaukee, said: "The eminently fair attitude of the public utilities cannot be overlooked. We like the utilities as customers. They give us an even break on business, do not try to squeeze down prices to the lowest possible level, present no credit difficulties, make available a broad distribution system. Through this bill you are endeavoring to injure the buying public at the expense of the manufacturer, favoring only a few middlemen." T. B. Meyers of Racine also spoke for the manufacturers, and E. J. Brown, Milwaukee, of the International Electrical Workers, said the utilities had been instrumental in keeping many contractors at work during the depression.

The Wisconsin Senate, by a vote of 16 to 15, on June 4 engrossed the Loomis public utility corporation bill (ELECTRICAL WORLD, May 23, page 936). Concurrence by the Assembly is assured. Machinery to carry out the intent of the power district act and other measures looking to public ownership is set up under this bill, which is designed to unify all power facilities, private and public. The Governor is empowered by it to name five directors, who will be paid $25 a day while actually engaged in state work.

The Legislature has already passed four of the six utility measures that the Governor asked for. Two of these were resolutions proposing constitutional amendments and two were bills. One of the amendments seeks to permit municipalities to acquire privately owned utilities without exceeding their constitutional debt limit and the other permits the state to develop a public power program at the wish of the people.

The Carow bill, preventing direct or indirect transfer of public utility permits to foreign utility corporations, whether by resolution, contract or otherwise, was engrossed by the Assembly June 4. An amendment offered by the committee on judiciary was adopted, striking out the prohibition of transfer through shifting stock control. Under the bill foreign holding companies are prohibited from performing any act which a public utility licensee is authorized to perform.

A committee bill for creation of an interim committee on power dams in boundary streams was also engrossed June 4. It provides for appointment of two assemblymen and one senator to investigate the problem of adjustment of taxes on power dams in boundary streams as well as on the connected power plants.

Beauharnois and Hydro Denounced in Ontario

CONTROVERSY CONTINUES to rage in eastern Canada over what is generally referred to as the "Beauharnois deal." The interested parties are buckling on their armor in anticipation of a big fight when the investigation by a parliamentary committee (approved on June 10 by the House of Commons) gets under way. In the meantime those who are vigorously opposed to the Ontario Hydro-Electric Power Commission's contract with the Beauharnois interests are waging warfare on the provincial government and crying for a showdown with private interests.

T. L. Church, a former Conservative member of Parliament and champion of the Hydro, has expressed the opinion that an injunction should be taken out immediately to stop the whole Beauharnois development as illegal. He is also urging that Canada come out unequivocally for a federal hydro policy—to develop, generate and distribute power at cost from navigable works on the St. Lawrence to the people of Ontario and Quebec. He eulogizes Governor Roosevelt of New York for "using every force he can muster to prevent the Mellon interests monopolizing the 1,000,000-hp. United States

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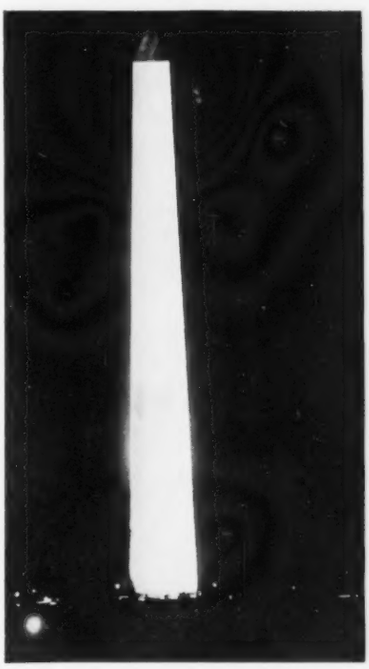
WASHINGTON MONUMENT FLOODLIGHTED



Underwood & Underwood

Powerful floodlamps have recently bathed Washington Monument, long regarded as a menace to night flying, in brilliancy.

share of the available energy on the international section of the St. Lawrence."

In an effort to prove the alleged unreasonableness of the Ontario Hydro entering into contracts with the Beauharnois, Gatineau and other private companies while it still has plenty of developed power of its own, Dr. George McQuibban, Liberal member of the Ontario Parliament, described a recent visit to the Queenston plant at Niagara Falls. "On the ten mighty generators there," he said, "each capable of delivering 55,000 hp. to 60,000 hp., there is a gage indicating the amount of energy actually being delivered. They were running from 50 to 65 per cent of capacity. Some of them were idle. Those which were running 100 per cent were those of 'export,' sending their energy across the Niagara River to the United States and feeding the great industrial plants to the south. Conditions were similar at other Ontario plants. Why? The Gatineau development has already thrown its shadow across the Niagara plant. You see, we have to pay for that Gatineau power, whether we use it or not. We have been told that the exported power is merely 'off-peak' energy. That is not so. It is going in broad daylight from 7 a.m. to 6 p.m., and it is there in scores of thousands of horsepower, for the simple reason that Gatineau and Quebec private power contracts are also there."

▼

Candlepower Measurement on New Scientific Basis

HERETOFORE RATHER INDEFINITE, the "candlepower" standards used in rating electric light bulbs, searchlamps, gaslights and other light sources has been made accurate and invariable in measurement by the Bureau of Standards after a series of experiments, according to an article appearing in the June number of the bureau's *Journal of Research*.

The source of light used in establishing the new standard was the open end of a small tube closed at the other end and maintained at a definite high temperature. The amount of light emitted from the interior of the tube through the open end is not affected by the material of which the tube is made, but depends only on the temperature. The tube actually used was composed of thorium oxide, a very refractory material, and was kept at a definite and reproducible high temperature by immersing it, closed end down, in a crucible of molten platinum. When the platinum begins to solidify, the immersed tube is at a definite temperature (3,224 deg. F.) and remains at this point as long as any liquid platinum is left. The brightness of this source was compared, using an instrument known as a photometer, with the standard electric lamps of the bureau. Many comparisons were made, and it was found that the proposed standard was accurately reproducible. The actual intensity of light from a square centimeter of this source was found to be 58.84 candles.

▼

Commission Modifies Potomac Consent Decree

WASHINGTON'S FAMOUS 4.2-cent domestic energy rate will go still lower if the Public Utilities Commission of the District of Columbia has its way. The latest move in this long-controverted case was an order from the commission this week intended to bring a modification in the consent decree by which electric rates have for six years been fixed. The commission's order reduces the company's allowable return from 7½ to 7 per cent. The commission, in the order, made no attempt to readjust existing rates, though it calls them excessive and unreasonable. This question, it was said, would be settled at a rate hearing in the future. The commission bases its asserted right to modify the consent decree upon a paragraph of the public utilities act. The company may appeal to the courts.

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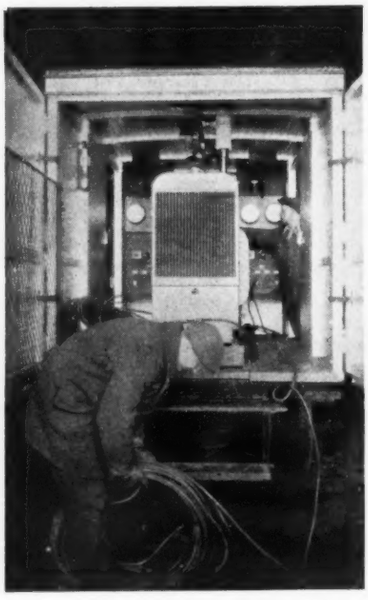
PORTABLE TEST SET WILL CHECK LINE BREAKS



To furnish power for testing underground equipment at isolated points the Buffalo General Electric Company has put into service this laboratory on wheels, furnishing 500 volts of direct current and up to 15,000 volts of alternating current.

Maintenance Engineers Get Together at Akron

NEARLY THREE HUNDRED electrical maintenance engineers and members of Middle Western electrical leagues attended the second annual conference of the Electrical Maintenance Engineers' Association at the Hotel Mayflower, Akron, Ohio, June 4 and 5. The program consisted of three business sessions, each occupying half a day, inspection trips and a conference dinner at which C. L. Collens, president of the National Electrical Manufacturers' Association, spoke.

Prominent guests included J. E. North, president Electrical League of Cleveland; L. E. Coen, manager Cincinnati Electric Club; Ted C. Brown, manager Electrical League of Indianapolis, and E. J. Bell, executive manager Electrical League of Youngstown. S. C. Hansen, manager Electrical League of Akron, acted as chairman of the first session, and L. G. Tighe, vice-president Ohio Edison Company at Akron, welcomed the visitors.

Subjects discussed in 30-minute talks at the business sessions were vacuum tubes, control, portable tools, electric welding, industrial trucks, electric furnaces and factory lighting. H. N. Wood, commercial manager Ohio Edison Company, Akron, gave the central-station point of view on overmotoring and undermotoring, demand and power factor and the joint effect of all these on power costs.

The association, formed at Cleveland seven years ago, held its first conference last year at Cedar Point, Ohio. This year's conference was under the joint sponsorship of electrical leagues in Cleveland, Akron, Youngstown, Cincinnati and Indianapolis.

▼

Mobile Consumers Win Contested Rate Case

RATES CHARGED to electric patrons in Mobile, Ala., by the Alabama Power Company under what is known as Schedule A were held illegal by the Alabama Court of Appeals in a recent decision upholding a judgment of the Mobile Circuit Court. The decision involved refunds to customers of about $150,000. The suit was brought as a test case by A. S. Tew, a patron.

In 1923 the power company petitioned the Public Service Commission to prescribe new rates for electric service, and the rates made applicable to cities of comparable size to Mobile were designated as Schedule A-3. The power company was not furnishing any electric service in Mobile at that time. In 1927 the Gulf Electric Company, then serving Mobile, and the Houston Power

SYRACUSE LIGHTING COMPANY'S NEW OFFICE BUILDING

At a cost of about $900,000, this seven-story-and-tower structure will be pushed to completion on Erie Boulevard, Syracuse, in nine months for the executives and clerical force of the Niagara-Hudson Power Corporation's central division. An engineering and maintenance building and a 300-car garage will be added later.

▼ ▼ ▼

Company were consolidated with the Alabama Power Company, and the consolidated firm began in 1928 furnishing electric service in Mobile under Schedule A, which was higher than Schedule A-3. A different schedule from either of these was authorized and applied in 1929, but the suit was for the difference between Schedule A and Schedule A-3 during 1928.

▼

Commission Studies Rate Diversity in New York

WIDE DIVERSITY in the form of rate schedules as well as the amounts charged for electricity in various cities of New York State is shown in tables to be published in its coming annual report, the Public Service Commission of the state announces.

The comparative tables show the amount of monthly bills paid by consumers in various municipalities. They were prepared by reducing the many forms of schedules and rate bases to standard units, determined by "more or less arbitrary factors." The commission's figures are based upon electrical energy consumption in a house of seven rooms and a net floor space of 1,400 sq.ft. This, the commission believes, is close to the size of the average house.

Because there is greater diversity in house sizes in the larger cities the commission has made a separate table for eleven municipalities in this classification. Two bases are used, one being for a house or apartment of six rooms or less with floor area of 1,000 sq.ft. or less. The other standard is a house of ten rooms with a floor space of 2,000 sq.ft. The cities named are New York, Buffalo, Rochester, Syracuse, Yonkers, Albany, Utica, Schenectady, Binghamton, Niagara Falls and Troy, New York figures being arranged by boroughs.

The tables show the wide range in types of service charges, varying from schedules based upon service charge, maximum-demand charge and energy rate to those built upon counted-room, energy and minimum-demand charges.

▼

Utica Rate-Reduction Total Still in Dispute

FURTHER EVIDENCE submitted by the Utica Gas & Electric Company to the New York Public Service Commission last week in the rehearing on the company's rates (ELECTRICAL WORLD, May 2, page 796) showed that the company has made a reduction of $107,200 by its present commercial rates as compared with $62,000 acknowledged by the commission accountants, but has made a reduction of only $95,000 in the residential rates as compared with $110,000 calculated by the commission. The tabulation submitted shows that on the basis of the 1928 consumption customers using 12 kw.-hr. per month or less and consuming 478,268 kw.-hr. would make no saving from the rates now in effect.

Unless the commission modifies its previous order, the Utica company must file a schedule of rates so distributed that a reduction of $69,000 will be accomplished under the rates now in effect, instead of the $39,000 accepted by the company. If no modification is forthcoming, the company will probably appeal to the courts.

▼

Utilities May Help Protect Airmen from Wires

A CONFERENCE AT WASHINGTON on June 2 between Colonel Clarence M. Young, Assistant Secretary of Commerce for Aviation, engineers of various kinds and representatives of the light and power industry arrived at no definite plan for the avoidance of possible hazards to airplanes because of high-tension power lines adjacent to airports. Colonel Young declined the suggestion of E. C. Stone, representing the National Electric Light Association, that the department appoint a joint committee of federal representatives, commercial air-line operators and utility officials to work out recommendations for marking airways. The Assistant Secretary asked the utility men themselves to formulate some uniform method of marking obstructions classified as hazardous by federal officials.

▼

No Chief Engineer for St. Lawrence Just Yet

GOVERNOR ROOSEVELT and the five members of the New York State Power Authority will inspect the site selected for state development of hydro-electric power on the St. Lawrence River early in August. This announcement was made at Albany on June 8 after a conference between the Governor and the Power Authority, the first since he appointed its members last month. Asked whether there would be an early announcement of the appointment of a chief engineer, the Governor said: "I do not imagine that such an appointment will be made for some time, because at present this is not an engineering problem."

It is understood that the Governor advised the power trustees to enter into negotiations with the federal and Canadian governments as speedily as possible in the hope of removing the legal obstacles which now stand in the way of the proposed development. Reports from Washington say that Chairman George Otis Smith of the Federal Power Commission has assured the New York board of his desire to co-operate in every way to facilitate early development.

Institute Prepares Its Asheville Program

SEVEN TECHNICAL SESSIONS are scheduled for the summer convention of the American Institute of Electrical Engineers, to be held at Asheville, N. C., June 22-26. Two of these will be held on each of the first three mornings after opening day and one on Thursday afternoon.

On the morning of Monday, June 22, there will be the annual business meeting, the president's address and the introduction of the president-elect, Charles E. Skinner being the official nominee. The president's reception will take place that evening, and during the convention there will be various other social events, besides drives, sports and entertainment and all-day excursions on Friday.

The technical program follows:

TUESDAY MORNING, JUNE 23

A. Communication Services for Electric Utilities.—Papers by C. F. Craig, R. N. Conwell, G. M. Keenan and E. C. Briggs, by Colonel William Kelly, by P. B. Juhnke, by C. A. Booker and M. E. Clark, and by C. E. Stewart.

B. Electrical Machinery.—Papers by D. D. Higgins and E. Wild, by L. A. Kilgore, by S. H. Wright, by V. Bewley, and by Ernst Weber.

WEDNESDAY MORNING, JUNE 24

C. Interconnections.—Papers by A. E. Bauhan, by E. W. Dillard and W. R. Bell, by H. S. Fitch, and by G. M. Keenan.

D. Electrical Units.—Papers by Marion Eppley, by I. Melville Stein, by L. T. Robinson, and by H. B. Brooks.

THURSDAY MORNING, JUNE 25

E. Automatic Stations.—Papers by O. K. Marti, by C. P. West and H. C. Griffith, by C. H. Sanderson and E. B. Ricketts, by F. F. Ambuhl and Garland Stamper, and by R. M. Stanley.

F. Cables.—Papers by D. W. Roper, by G. B. Shanklin and F. H. Buller, by R. W. Atkinson and D. M. Simmonds, by J. B. Whitehead and F. Hamburger, Jr., and by D. C. Holmes.

THURSDAY AFTERNOON, JUNE 25

G. Research and Selected Subjects; Technical Committee Reports.—Papers by T. E. Browne, Jr., by H. W. Dodge and C. H. Willis, by D. C. Jackson, Jr., and by J. R. Eaton, J. K. Peck and J. M. Dunham.

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Navigation Ranks Power, Says Wisconsin Court

NAVIGATION, NOT WATER POWER, must still be the primary consideration of the Wisconsin Railroad Commission under the law, when their interests conflict. So the State Supreme Court decided in a recent order affirming Judge A. H. Reis of Wausau in most of the points of his decision in the litigation between the Flambeau River Lumber Company and the Chippewa & Flambeau Improvement Company over water rights in the Flambeau River.

Judge Reis vacated an order of the Railroad Commission which gave the company last named the right to regulate the flow of water at Rest Lake and the Flambeau Dam, enjoined it from holding up water wanted by the lumber company to float its drives and awarded $7,400 damages to the lumber company because its 1927 drive was "hung" for lack of water. The only reversal was of his attempt to fix a minimum flow for the benefit of the log drives. The high court decided that only the commission could fix the flow and that it should do so.

The Railroad Commission issued an order on March 3, 1928, giving the power company the right to regulate flow, but requiring that it let a minimum flow of 150 sec.-ft. over the dam when the lumber company gave notice that it wanted to float logs. The lumber company sued the commission to vacate this order and sued the power company for damages for the "hung" drive and subsequent drives which it did not make.

"It may well be that the use of water for hydraulic power purposes is more important from a public standpoint than the use of water for navigation," the Supreme Court held, "but the terms of the water-power act foreclose the commission from considering this. Its duty is to improve navigation, not to destroy or impair it. If with the passage of time navigation has become of decreasing importance, a new situation has arisen for the Legislature to meet."

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ONCE MORE A MYRIAD PLAYERS OF MINIATURE GOLF WELCOME ELECTRIC LIGHT

—Keystone View Co.

Quaint golf courses are again blooming on the vacant lots of a thousand cities. In southern California, where the calendar does not interrupt outdoor pursuits, the one shown above probably kept right on blooming. Crouse-Hinds illuminating engineers regard it as exemplifying the best lighting of its kind.

Scattered Happenings in the Electrical Sphere

UNITED STATES

Coming Safe Harbor Power Lines

An application has been filed with the Pennsylvania Public Service Commission for approval of the incorporation of the Pennsylvania Transmission Company to finance construction of two transmission lines from the hydro-electric generating plant at Safe Harbor to lines of the Pennsylvania Water & Power Company and the Consolidated Gas, Electric Light & Power Company of Baltimore. The cost of the two lines is estimated at $1,100,000. The first line is to be completed by December 1 of this year, while the other will be finished two years later, the application shows.

Another Generator Goes in at Huntley

Another 80,000-kw. generating unit went into service at the Huntley steam station in Buffalo last week. This unit is a duplicate of the one that went on the lines last December, and it brings the total capacity of the Huntley station to 466,000 kw., or almost 50 per cent more than that of the Schoellkopf hydro-electric station at Niagara Falls.

El Paso, Too, Wants Lower Rates

Believing "that the general decline in commodity prices and production costs is not adequately reflected in local utility rates," the City Council of El Paso, Tex., has hired Burns & McDonnell, Kansas City rate experts, to investigate electric and gas rates and submit reports by October 1.

Morse Asks for $2,000,000 More

Sale of an additional $2,000,000 worth of city light bonds to finance purchases and construction connected with development on the Skagit River and at Seattle power stations is under consideration by the Seattle City Council. The bond sale was requested by the new lighting superintendent, W. Chester Morse, who said that expenditures for the city light department, mostly for new machinery and work on the Diablo power house, would total approximately $3,755,000 by December 1.

No Table Rock Construction Yet

Officials of the Empire District Electric Company of Joplin, Mo., are quoted as saying that it is very unlikely that work will be started this year on the large hydro-electric plant to be built at Table Rock on White River, where $35,000,000 is eventually to be expended.

Oregon Water-Power Permits Canceled

Cancellation of 25 applications for water-power permits which the holders failed to have transferred from the office of the State Engineer and the Reclamation Commission to the new Oregon Hydro-Electric Commission is announced. Among these applications were five filed by the California-Oregon Power Company for water from Klamath River.

Appraisal of St. Louis Utility Begins

Appraisal of the physical properties of the Union Electric Light & Power Company of St. Louis has been started by an engineer of the Public Service Commission. The audit and physical survey will probably take more than a year and cost about $200,000. The cost will be borne by the company. The last appraisal of the Union Electric was made in 1915. Arguments of counsel in the pending rate case will be heard on July 6 by the commission. Testimony was completed on March 26.

Agricultural Engineers to Meet at Ames

Electricity will, as usual, play a large part at the annual meeting on June 22 to 25 at the Iowa State College in Ames of the American Society of Agricultural Engineers. Dr. E. A. White will talk on "Ten Years of Rural Electrification," and practical papers will follow by R. E. Hayman of the Oklahoma Gas & Electric Company, C. P. Wagner of the Northern States Power Company, T. E. Hienton of Purdue University and E. G. Nichols of the Iowa Railway & Light Corporation. At another session irrigation, hay curing and grinding will be discussed in their relation to electric supply. Other authorities on rural electric service will address a third session.

Petitioning Villagers Fail to Appear

After 62 petitioners of the village of Cameron, Wis., had complained to the Railroad Commission that the electric rates of the Northern States Power Company were unreasonable and discriminatory, not one was present at a hearing held there May 28 and no action could be taken.

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Coming Meetings

Public Utilities Advertising Association—New York, June 14-16. Room 1748, 4 Irving Place, New York.

Association of Iron and Steel Electrical Engineers—Cleveland, June 15-19, J. F. Kelly, Empire Bldg., Pittsburgh.

Illumination Conference—New York, June 15-17. Westinghouse Lighting Institute, 46th St. and Lexington Avenue.

Canadian Electrical Association—Banff Springs Hotel, Banff, Alberta, June 16-18. H. W. Lyster, 407 Power Bldg., Montreal.

American Society of Agricultural Engineers—Ames, Iowa, June 22-25. Raymond Olney, St. Joseph, Mich.

American Institute of Electrical Engineers—Summer convention, Asheville, N. C., June 22-26; Pacific Coast Division, Lake Tahoe, Calif., Aug. 25-28. F. L. Hutchinson, 33 W. 39th St., New York.

Pacific Coast Section, N.E.L.A.—Del Monte, Calif., June 24-27. K. I. Dazey, 447 Sutter St., San Francisco.

Camp Co-operation XI—Association Island, Henderson Harbor, N. Y. July 27-31. Society for Electrical Development, 420 Lexington Avenue, New York.

Cheat River Now Before Power Board

Another question of federal jurisdiction similar to the New River case has arisen on the Cheat River in West Virginia and has led to recent informal discussion between members of the Federal Power Commission, I. Wade Coffman, chairman of the West Virginia Public Service Commission, and representatives of the West Virginia Power & Transmission Company. The company is requesting a license in pursuance of its preliminary permit.

Great Lakes Division's New Officers

Lucius B. Andrus of Indianapolis, president Northern Indiana Power Company, has been elected president of the Great Lakes Division of the N.E.L.A. for the 1931-32 term, succeeding on July 1 Eugene Holcomb of the Consumers Power Company. John B. Learned, vice-president Public Service Company of Northern Illinois; S. B. Way, president Milwaukee Electric Railway & Light Company, and Herbert Silvester, manager Detroit Edison Company, were elected vice-presidents.

CANADA

Seventh Unit for Back River Plant

Preparations are being made for the installation of the seventh unit in the Back River plant of the Montreal Island Power Company. This company brought four units into operation in November, 1929, and an additional two early in 1930. Ultimate plans of the company call for the installation of ten units with a maximum capacity of 12,000 hp. each and a minimum of 7,000 hp.

Ontario Hydro Reorganized

Appointment of John Robert Cooke as permanent chairman of the Hydro-Electric Power Commission of Ontario, in succession to C. A. Magrath, who resigned last January, and of Arthur Meighen, former Prime Minister of the Dominion, to fill the vacancy on the board caused by Mr. Cooke's elevation, has just been announced by Premier George S. Henry of that province. The third commissioner, C. Alfred Maguire, will probably become vice-chairman.

ABROAD

Vera Cruz Contract Void?

A contract with the Vera Cruz Electric Light & Power Company, a subsidiary of the American & Foreign Power Company, has been canceled by that Mexican municipality on the ground of failure to comply with a clause stipulating that the original owners—Pearson & Son—could not lease or sell their rights without approval of the city government. American & Foreign Power officials say that under Mexican laws public utilities are under federal, not municipal, jurisdiction and add that in any case the contract in question had expired. The company has obtained a temporary injunction.

Drawn by
Nathaniel Yonteff—1931

N·E·L·A
1931

J. F. Owens

► The objective of the industry is the complete utilization of electricity in every house. To attain this objective co-ordination and co-operation must be our watchwords. We must approach our problems in a spirit of fairness

Drawn by
Nathaniel Yonteff—1931

N·E·L·A
1930

R. Alton Jones

▸ There is no industry in the country which is more stable than the industry which furnishes electric light and power and there is no industry which can look forward to its future with greater equanimity

Utilities Co-ordinate Their Plans

THE fifty-fourth milepost of the light and power utilities was passed at Atlantic City this week. Men and women of the industry discussed their problems, policies and opportunities. They looked over the latest products of manufacturers and mingled together in friendly intercourse. The program was full and informative, the attention was keen and the results will be valuable. Any interpretation of this meeting must be limited, however, because properly to appraise it would require the digestion of eighty addresses and the measurement of the opinions of the seven thousand in attendance.

Public relations was the dominant subject discussed, and a new and militant policy was announced by President Jones, Managing Director Clapp and other leaders. War was declared against traducers. No longer will cheeks be turned when agitators attack the industry with false and misleading statements. On the contrary, an attitude of constructive aggression will be assumed. Every electrical man and woman was urged to challenge agitators instantly when they defame the industry. Too long have electrical men kept silent when untrue charges have been hurled at them. They should wage war vigorously against the baiters and false prophets who seek to destroy the industry and undermine public faith in its integrity.

Wise leadership will be required to make this conflict constructive and prevent it from degenerating into the enunciation of generalities and opinions. Clamorous debates are well liked by agitators. Moreover, work must be done to assemble all the facts needed and to disseminate them to the three hundred thousand men and women in the ranks. But all this can and should be done because the new policy is sound and opportune.

It is based upon the civic duty of the industry. Light and power utilities are a necessary part of the social and industrial structure of this country, and they reach twenty million customers with their service. Above and beyond any selfish interest is the civic obligation to prevent the discarding of the economic principles under which this country has prospered. Those who attack the utilities with the ultimate object of socializing all industry must be forced into the open and discredited.

HOME use of electricity through market development and rate inducements received especial emphasis. Reports concerning the progress made in the refrigeration campaign were very gratifying, and plans were laid to get an equal volume of sales for ranges, water heaters and other devices. Decided progress was made in the development of plans for better trade relations. These hinge upon co-operative efforts in each locality and co-ordinated national plans by executives. Both the exhibits and the reports from properties reflected the business possibilities in the home market, and a very aggressive sales effort will be made by the industry in the coming year. As pointed out by H. P. Liversidge, the point is not whether utilities should merchandise or not, but how they should merchandise. Merchandising is a part of public relations work because it is a direct and continuous source of customer contacts and because it is a necessary part of utility service in the present stage of market development and sales organization. Confidence may be had that

and Assume Aggressive Attitude

trade relations and sales organizations will be perfected to insure intensified electric service to homes in the near future.

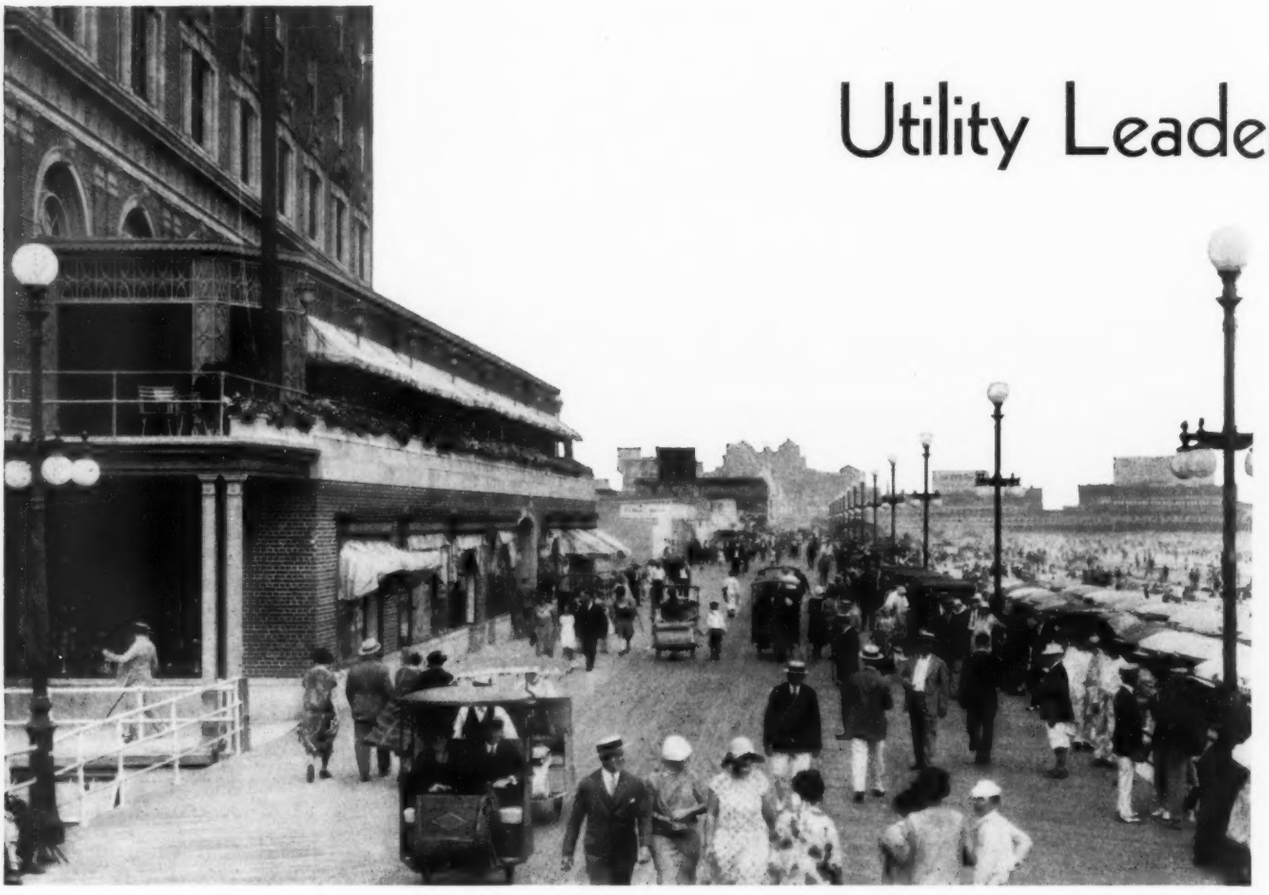
ENGINEERING features of the industry were not stressed and the attendance of engineers was limited. This was unfortunate, because engineering is the foundation of the industry and the hope for its future expansion and stability lie in maintaining the highest possible engineering talents and standards. Even now the largest opportunities for savings and for expanding service are tied in with engineering, and care should be taken that the engineering personnel is maintained on the high plane that has made progress so quickly and economically in the past. The light and power industry should not have it alleged, as is done about the railroad and street railway industries, that failure to meet new conditions came about because engineering prestige and competency were neglected and executives failed to draw into these industries the best brains from the engineering schools. The electrical art is still new and the future of the industry still depends upon engineering.

Another significant topic of the convention was the education of employees and the promotion of employee morale through planned efforts. It was clearly recognized that a social obligation rests upon executives to apply the best management principles to employee relations. It was also clearly recognized that the three hundred thousand men and women of the industry are the best agencies for the development of good public relations in their external contacts and that this work cannot be done unless employees are informed and made secure and enthusiastic in their positions. It is very encouraging to find the electrical industry executives taking the lead in the modern trend toward a better handling of the problems of employer and employee, and the address of Gerard Swope is worthy of serious study.

Hovering over the convention as it hovers over all business was the specter of government in business and the increased cost of government. The trend toward direct taxation of energy production and of export energy, together with larger taxes on physical property, was pointed out, and its cost and its injurious effects on social and economic welfare were dealt with in detail. The hope was expressed that some way could be found to reduce the cost and improve the efficiency of government. In dealing with this question the industry again exposed the forces at work to socialize all industry through attacks on utilities and showed the selfish or radical motives of those who lead the attacks. A call was sounded for the defense of American institutions and practices that have proved so successful in bringing this country to its present plane of accomplishment.

FACTS were faced, problems were stated and counsel was taken, but the keynote of the meeting was found in the courageous and hopeful attitude taken by industry leaders. There will be no going back. There was no defeatism—no counsel of deflation. Based upon the inspiring message of the convention speakers, the electrical industry gained impetus and courage from this milepost meeting in Atlantic City to build its future on a par with its past.

Utility Leaders S



CONSTRUCTIVELY and aggressively the leaders of the National Electric Light Association at Atlantic City this week surveyed conditions in their industry. They advocated an aggressive attitude toward agitators who seek to injure it; they reiterated their belief in private enterprise and state regulation; they sought better practices; they outlined possibilities for cost reductions; they dealt with trade relations; they discussed the morale and education of employees; they formed programs for better public relations, and they outlined ways and means to extend electric service and sell appliances to the homes, farms and industries. More than 80 papers were presented at the meeting, and a remarkable degree of agreement existed in the points of view expressed for the solution of current problems and the development of the business to its full possibilities.

Attendance was less than usual, but very representative, and thoughtful and serious audiences crowded the meetings. The exhibits were better and more artistic than ever before and were dominated largely by electric appliances. This is indicative of the interest in domestic sales. Entertainment features were splendidly conceived and carried out, and an outstanding spectacle called "The First American," was given by Indian artists brought from the West. "Edison Day" was a notable feature that created a fine impression.

The counsel of courage given by industry leaders and the many helpful and practical committee reports gave new impetus to electrical progress. Faith, courage and aggressiveness were imbibed by all those in attendance, and this most profitable fifty-fourth convention may be said to have marked a new milestone in the progress of the industry.

At the opening of the convention significant addresses were made to show the broad scope of the light and power business and the intimate relations it has with national and even international well-being. Mayor Harry Bacharach of Atlantic City welcomed the association and expressed his disapproval of government ownership and of legislative interference with private business. The address of President W. A. Jones, which followed, was an outstanding statement of fact and policy. He vigorously defended the record of the industry and urged every employee to fight the smoke of misrepresentation with the clear fire of facts. He called upon the industry to challenge the forces that were attempting to socialize it and which would hamper electrical development by restrictive and ill-advised legislation. Political defamers who make generalized statements should be called to account quickly and vigorously. He also stressed the need for the application of principles of good management in the industry, the necessity for ethical conduct of business and the opportunities for more business that could be had through aggressive selling. He viewed the future with confidence and called upon electrical men and women to stand fast for American standards.

Treasurer P. S. Young gave a report of the finances of the association, and it was encouraging to note that

Survey Conditions

N. E. L. A. meeting has program for aggressive industry development. Domestic market enlargement stressed. Defamers of industry to be called to account.

budgets have been approved to continue the work of committees and support of research activities during the coming year.

Managing Director Paul S. Clapp gave a brief but informative address on association work. He laid emphasis upon the growth of electric service and upon the development of association activities. Membership today is 21,563 as compared with 200 in 1900. More than 5,700 workers are enrolled as officers and committee members. The women's committee within ten years has grown to embrace 800 local organizations with the participation of 15,000 women. Mr. Clapp urged utilities to take definite and aggressive action in all localities against the attacks, misstatements, partial truths and sometimes palpable lies launched against them. He urged training of employees as part of this constructive work and outlined work on the eleven educational pamphlets for employees that will aid in this training.

A long and broad look at business was given in an address by David Lawrence, president of the *United States Daily*. He said that business is a composite of industries, and that individual industry ills cause business to be bad. Mr. Lawrence urged the free play of the laws of supply and demand throughout the world without government interference, tariffs and other artificial influences if these tended to go against the natural laws. He thought a complete readjustment in interest rates was under way and said that America had a choice of being a domestic producer and consumer or of being in a world-wide market.

Harry Reid, chairman of the Public Relations National Section, outlined what is being done to promote better public relations and stated the principles upon which public relations work should be undertaken. He agreed with Mr. Jones and Mr. Clapp that the time has come to call to account those who make false assertions about the industry.

The value of electricity to homes and industry was outlined by Gus W. Dyer. He showed what electrical service means to a region and urged that rural electrification especially be pushed vigorously. He also stated his faith in private ownership and enterprise and his disagreement with those who are attempting to hamper and socialize the industry.

As the final feature of this session Lawrence A. Hawkins of the General Electric Company gave a demonstration of new developments in research work. Photo-electric cells and their application, and improved devices for study and measurement of atoms were parts of a remarkable exhibition.

Simplification in accounting

Public relations are not a separate and distinct aspect of the utility business. They constitute an inseparable part of the departmental activities of every branch of the business, in the opinion of John L. O'Toole, vice-president of the Public Service Corporation of New Jersey, as expressed to the Accounting National Section. A new term is desired to replace the shopworn expression "public relations," coined in an age when executives first awakened to the realization that they had the public for customers. Public attitude towards the electric company is determined by the way the individual customer is treated in every contact he has with the company and its employees. These contacts are no more

important anywhere than in the groups associated with the accounting function.

Continuity of service is more or less taken for granted, but the technique of establishing the basis for getting service is not. At this point too much red tape and formality, too much insistence on prior guarantees and too much delay in establishing the service connection can predispose the customer to discount a superior quality of continuous service for months afterward. Likewise errors in billing should be kept to an absolute minimum if the customer's good will is to be confirmed. Machine billing has gone far to accomplish this. The rest of the problem of the accounting executive is one of integration to secure the greatest degree of co-ordination from employees individually encouraged to eliminate friction from all their contacts with customers.

The engineer asks the accountant to set up his accounts in such a way that they will yield dependable costs identifiable with jobs similar to those on which the engineer is asked to estimate and budget. The engineer is expected to work out in detail the best and most economical method of supplying the ascertained or prospective needs of the properties. In this connection the accountant is asked by the engineer to contribute the benefits of his skill in recording and analyzing receipts and expenditures of money so that the element of estimate will be curtailed to those features of enginering adaptation wherein proficiency is rightfully expected of the engineer. This is the basis of effective co-operation between accountants and engineers, according to H. W. Fuller, chief engineer of the Byllesby Engineering & Management Corporation, Chicago, and formed the nucleus of his address to the accountants.

Engineers broaden program

A decidedly healthy sign was evident in the engineering section session. It involved an introspective attitude, the presentation of outside viewpoints and the first specific, tangible answer to "Why the spread between production costs and selling price?"

Chairman Alex D. Bailey, opening the session, referred to the feeling encountered in some quarters that this industry has deveolped to a high state of perfection and that there is not much more which the engineer can do to reduce costs. He pointed out that there is an inconceivable number of units involved and that these small increments amount to a tremendous sum in the aggregate. Furthermore, the industry is just on the threshold of tremendous technical improvement and development. In substantiation of this statement he cited possible rural developments, new applications of power which research may make possible, development made necessary by expansion in present fields, new problems in the use of steam and combustion of fuel, studies in plant construction to reduce investment costs, reduction or elimination in building structures, co-operation of electric supply companies and large process-steam or by-product industries, standardization, and lightning protection of transmission lines.

While there will be considerable improvement and further reduction of costs, the increments will be relatively small, and it is to the higher load factors and increased utilization that engineers must look for the greatest reductions in cost.

George N. Tidd, whose address is abstracted elsewhere, called attention to an economic waste due to acci-

Leading Indian performers in the "First American"

dents. While the loss per employee per year is lower than the average for the country, he contended that the same administrative policies and procedure which have effected such marked economies in the generally recognized functions of utilities can be applied to reduce still further the loss from accidents. He presented eight suggestions to assist executives in improving the situation, chief among which were bringing pressure to bear to compel reduction of accidents and fixing responsibility, establishing engineering specifications on clearances and safeguards, inspection and maintenance schedules to forestall faults, a code of operating rules, and promotion of "safety consciousness."

Human and spiritual factors deserve more consideration than in the past, Mr. Tidd declared. Accident prevention is one of the best methods of assuring economical, reliable operation, developing employee morale and building public good will.

An outside viewpoint was emphasized in an address by Dr. Harvey N. Davis, president Stevens Institute, who took a radical attitude against permitting air pollution but injected the sober, rational viewpoint that is most helpful in solving any problem. Dr. Davis divided agitation in favor of smoke abatement into four classes with the respective motives of fuel economy, avoidance of property damage, preservation of public health and removal of depressing psychological conditions. The first motive also actuates utilities in eliminating smoke. Regarding the other motives he explained that factual substantiation of effect is not always available and that more specific data are needed. Nevertheless, clearing up the atmosphere is one of the easiest ways of building good will, he declared.

Various problems of improving the situation were recognized, among them being, first, development of

simple, reasonable, rational ordinances which can bring unco-operative polluters of the atmosphere into line when friendly methods fail, and, second, fair definitions of smoke, cinder, "fly ash" and SO_2 or SO_3 nuisances. Dr. Davis expressed the hope that any rules adopted would be so fair that the majority would voluntarily adopt them. Such rules can be promulgated, he added, if competent counselors like utility engineers will assist as they are already doing. In 25 years, he ventured to prophesy, it will not be economical to burn raw coal as it will pay to process it first. Then will most of the smoke problems be solved.

President W. A. Jones referred to engineers as the salt of the earth because of their contributions to public service and their help in starting business back toward a rational value.

A classic paper was presented by A. C. Marshall and H. A. Snow on a subject around which greater misinformation has gathered than has probably gathered around any other—distribution costs. Based on a specific metropolitan distribution system, they broke down total distribution costs for domestic customers and showed specifically the detailed functions for which the consumer's dollar is expended. They also showed how this total expense changes with kilowatt-hour usage per year—about 10 cents for 200 kw.-hr., 5.28 cents for 500 kw.-hr., 2.23 cents for 3,000 kw.-hr. The basis for arriving at these figures was presented. While all his assumptions may not be accepted by some engineers, Mr. Marshall pointed out that the analytical procedure permits any one to substitute his own assumptions. Even then the final results will not be greatly altered.

Nominations for office in the Engineering Section for the coming year included A. H. Kehoe as chairman and Mark Eldredge as vice-chairman.

Women's committee observes birthday

High executives of the association felicitated the women's committee upon the completion of its first ten years of service to the industry. Martin J. Insull gave the principal address, reviewing the history of the committee's organization and citing at length the opportunities for the women of the power industry to leaven public opinion by practicing good public relations and making clear the ideals and objectives of the central station as a servant of modern civilization.

First Vice-President J. F. Owens sketched the need of facing the future courageously and with firm faith in individual initiative as the basis of American progress.

President Jones added his personal congratulations to the committee, and Loring A. Schuler, editor of the *Ladies' Home Journal*, depicted the completely electrified home of the near future. Mrs. Ralph Borsodi, Suffern, N. Y., told of the economic justification of electric household equipment in her home. The home service program of the N.E.L.A. was outlined by Miss Ada Bessie Swan, Public Service Electric & Gas Company, Newark, N. J.

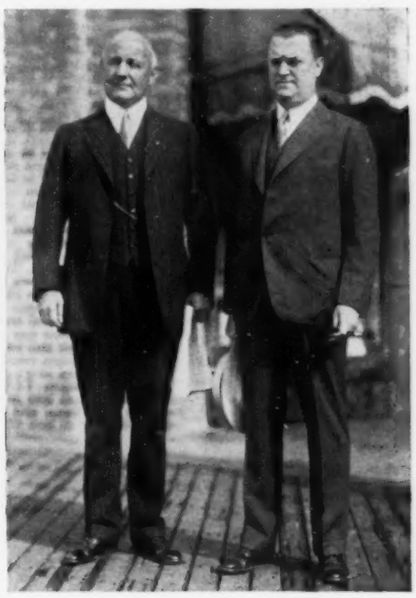
Commercial and political problems attacked in general session

Two addresses in particular aroused prolonged applause in the second general session—one by W. C. Mullendore and the other by J. F. Owens. These speakers and others concentrated on commercial and political problems facing the industry.

Some of the vicious, bitter, untruthful attacks on the utility industry were answered by Mr. Mullendore in a masterly presentation which might effectively be repeated in every community in the country. He did not claim that the utility industry is perfect and he welcomed fair criticism, but he did object most strenuously to the unfounded statements which have been made to stir the emotions of hate, fear and envy, break down confidence in legitimate ethical business conduct and displace the basic business principles of this country.

Referring to the statements that utilities are gouging the public, he pointed out that the electric service bill represents only 2 per cent of the average family budget and that taxes, crime and traffic in liquor collectively cost the public thirteen times the total electric light and

Carl D. Jackson, J. F. Owens, Harry Reid, Harvey C. Couch, W. H. Onken, Jr.



P. M. Downing, A. E. Wishon

power revenue. He pointed out that municipal electric light bills in the states represented by some political agitators are from three to four times those of other systems. He reminded his hearers that the Post Office Department deficit from allowing politicians to use the franking privilege on voluminous propaganda against utilities is making the public pay for the destruction of private property. Tariff, armament and other national problems that demand solution are being neglected by the agitators to make an issue of the "power trust."

Does this situation show statesmanship or utter lack of intellect? Mr. Mullendore asked. If there are so many cases of political corruption by utilities that certain politicians indict the entire industry, these politicians are neglecting their duties in not removing the violations which they, by wholesale indictment, infer exist also in their own states.

Distribution costs must be reduced

Mr. Owens attacked the general business problem by saying that too much time is spent in placing the blame for the depression and not enough time in diagnosing how each component of business contributes to the situation. To sell more there must be more buyers; in order to buy buyers must have money; to have money there must be stabilized employment. There has been a high degree of perfection in production economies but little accomplishment in minimizing the costs of distribution. Legislation never has cured business problems. They must be solved by business groups through group conferences. If they do not do this, some outside agency will attempt a cure in a way which may be disastrous. Programs which are based on selfish interests and not on what is best from the customers' viewpoint will fail.

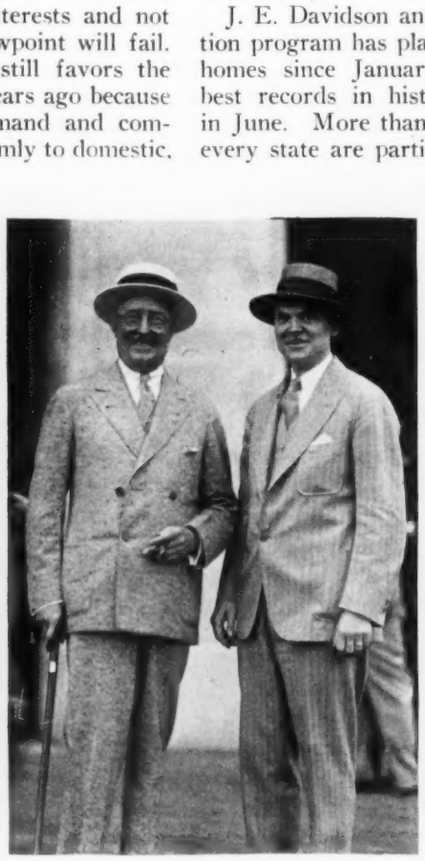
Henry L. Doherty declared that he still favors the three-part rate which he announced 35 years ago because it equitably provides for customer, demand and commodity charges and can be applied uniformly to domestic, commercial and industrial customers, large and small. But there is more difficulty in adopting it now, he said, unless all utilities follow suit. He cautioned against any promotional rates which do not consider equities because they may develop embarrassing situations that cannot be corrected without changing rate forms.

Regarding agitation against utilities, Mr. Doherty declared that happy, properly trained and informed employees provide the best medium of avoiding public irritation and correcting public misunderstanding. It is time, he declared, for utility executives to step out of their rôle as such and assert as citizens their prerogative of free speech. Unfriendly politicians by devoting all their time to the power issue are neglecting more pressing and vital problems.

Commercial men have a very definite obligation and responsibility in gaining and holding public confidence, declared T. O. Kennedy. The major objective of utilities is to increase the use of electric service. This requires stimulation of all trade outlets and adoption of the best ethical practices. Cost of service should hardly be an element in any customer's mind because it averages only 10 cents a day in homes and usually below 2½ per cent of production cost in industries. Commercial men have a definite responsibility in developing more appropriate rate structures because the kilowatt-hour charge subordinates the predominance of fixed charges. Promotional rates must be supplemented by applications that will enable more extensive use of energy. Increasing the service which small users can derive from their outlets is the surest way of eliminating dissatisfaction with rates, Mr. Kennedy concluded.

J. E. Davidson announced that the national refrigeration program has placed electric refrigerators in 375,000 homes since January 1, April and May showing the best records in history, with equally bright prospects in June. More than 8,500 cities and towns spread over every state are participating, the utilities being assessed

P. S. Arkwright and B. F. Weadock



F. C. Sargent and V. M. F. Tallman

A. M. Perry and A. C. Marshall

10 cents per meter. If the plan had been started one year sooner, there would have been no anti-utility merchandising legislation, he declared. If this year's bogey of 1,000,000 refrigerator sales is attained—and it is confidently anticipated—these new units and those formerly purchased will bring $80,000,000 energy revenue a year to utilities.

No human being is sufficient unto himself, Marshall E. Sampsell reminded his hearers, but willingness to work in harmony and fulfillment of that desire are two different things. He re-outlined the organization of the Society for Electrical Development which makes co-operation possible and pointed out that establishment of trade harmony and adequate wiring and outlets are two essentials for bringing mutual benefits.

Build loads with good public relations

"Future programs for increased sales of electricity must take public relations into account more than ever before," asserted H. P. Liversidge, vice-president and general manager Philadelphia Electric Company, before the Commercial National Section. In a trenchant paper the author focused industry attention upon the customer's viewpoint in relation to service development and revealed the causes and remedies of some amazing misunderstandings of the electric light and power business and its objectives which hamper larger usefulness. He stressed the importance of escaping the temptation to capitalize upon the mysteries of electrical technology in dealing with the public, as in bill adjustments, contract negotiations and service regulations, and advocated treating electricity as a commodity instead of a complex service in popular business relationships.

The same note of seeking public confidence was sounded in Chairman T. O. Kennedy's address. He maintained that the surest road to better public relations is through increased commercial activity. Along with this must go the use of rate structures encouraging maximum use of energy and the refutation of false charges against the industry. Satisfactory co-operative relations with all electrical dealer outlets in merchandising, based on sincere agreements to maintain ethical standards, are also of great importance, he said. The speaker called attention to the insignificant proportion of the modern domestic budget represented by electric service and pointed out that the commercial men and women of the industry will welcome an opportunity to participate in the fight for the central station's good name, feeling that they can render real service in the cause.

Full speed ahead has been attained in the electric refrigeration campaign, George W. Allison, manager of this activity for the Commercial National Section announced. More than 400 organized bureaus and 8,586 active committees are now at work upon the objective of selling 1,000,000 electric refrigerators in 1931 in this country in the 20,000 communities served electrically. Seventy-five manufacturers are producing these units. The campaign has been under way less than ninety days, and sales are mounting rapidly. Mr. Allison pointed out that if the campaign succeeds in selling its quota, an industry will be stabilized, a workable understanding brought about among mutually concerned groups and a long step taken toward sound and promising merchandising principles and practices. The speaker estimated that, taking all this year's activities into consideration by refrigeration interests, about $25,000,000 will be expended in promoting this work before 1932.

Martin J. Insull

Paul S. Clapp, W. A. Jones

Eight years ago Samuel Ferguson, president of the Hartford Electric Light Company, revealed to the New England Division of the association the potential load-building value of domestic promotional rates and their capacity to change the whole merchandising situation by putting a power rate in every home socket and outlet. In a paper entitled "Volume and Diversity in Domestic Sales," Mr. Ferguson showed that the application of such rates in his own company has increased the annual energy consumption per residence customer about 220 per cent since 1921, when the departure was made from the usual straight-line meter rate. The speaker also presented illustrations of the value of off-peak water heating and urged all commercial men to investigate the load-building possibilities on their own properties and convince their own executives how worth while the cultivation of economical sound usage is in home and industry.

W. H. Sammis, chairman of the Commercial and Industrial Power and Heating Bureau, told of the varied activities of the organization and the outlook for increased business in the industrial heating field and other manufacturing circles. J. H. Van Aernam, New York Power & Light Corporation, spoke on the importance of selling adequate house-wiring and domestic-service equipment on a comprehensive plan competitive with nationally merchandised products and services. He outlined a program for carrying this plan out in considerable detail.

Bringing business back

"It is not a question of general business coming back, it is a question of bringing it back," said Merle Thorpe, editor of *Nation's Business,* at the Thursday morning general session. And it is going to be hampered in coming back by the brakes imposed upon recovery that are represented by a dangerously growing tendency toward greater government interference with business and the enlarged burden of taxation required to support these governmental activities, according to C. E. Groesbeck, president Electric Bond & Share Company. Further than that, a recovery of business must look toward measures which will stabilize the business of the future and curb the invasion of the business field by government. This, in the opinion of Gerard Swope, president Gen-

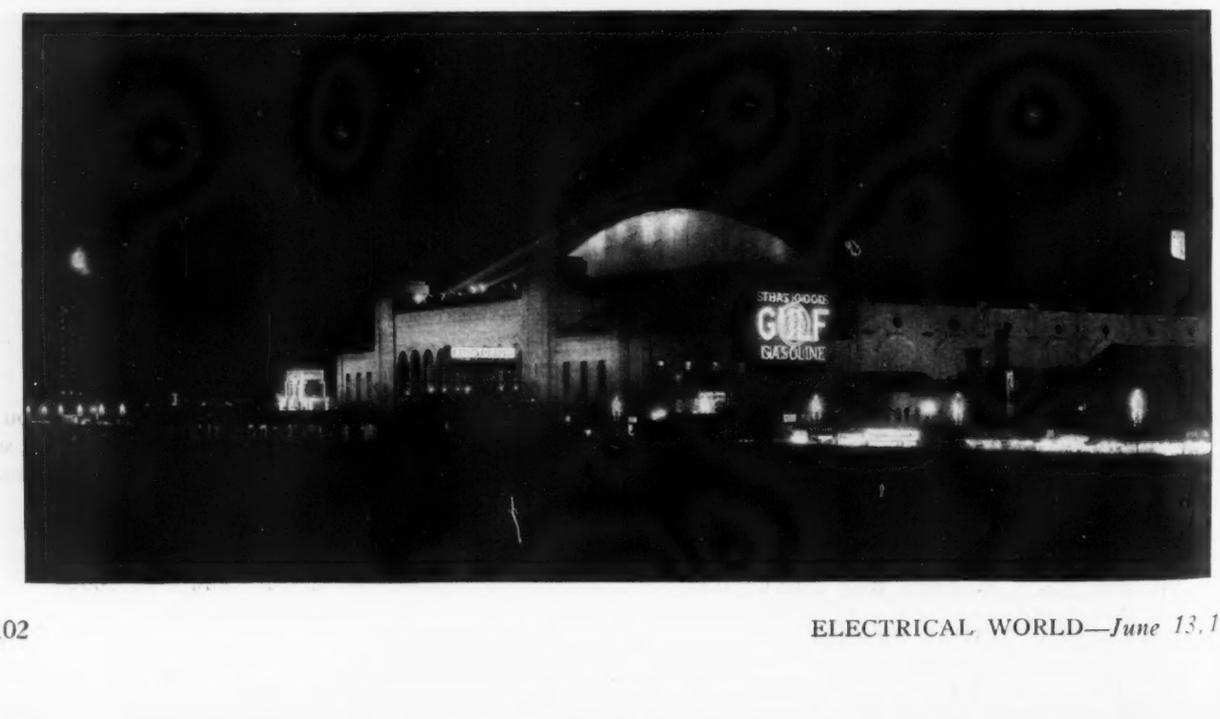
Mr. and Mrs. L. O. Ripley

eral Electric Company, calls for the stabilization of employment and the removal of the burden of worry from the minds of workers in industry. If industry does not undertake this in its own behalf, government will undertake unemployment relief in insurance measures and thus multiply its instances of competition with its own citizens and their legitimate business enterprises.

Chairman Bailey of the Engineering National Section called attention to the continued dependence of the progress of the industry upon the accomplishments of the engineer. Engineering is not at its peak or even on a plateau. Electrical production and distribution are still on the threshold of a great development. The unattained goal of the engineer continues to be "the best possible service at the lowest possible price." In the past the public utilities have attracted the best engineering talent available. This must continue to be the case, and those who enter the field must be assured that they can pass on to broader interests of administration and activities that incorporate human relations of industry. Much of public satisfaction in electric service is today attributed to the engineer's unceasing efforts at economy and improved service. His morale in this direction must be sustained if the good will of the public is to be secured.

Mr. Groesbeck, in his address, dwelt on the fact that none of the romantic business enterprises which have made this nation famous for initiative and prompt accomplishment have been the result of governmental engagement in those businesses. On the other hand, railroads, shipping, mercantile enterprises have invariably suffered when government exercised too oppressive an attitude or even pre-empted the field for itself. It is not alone the big businesses which suffer in this respect. Insurance interests are experiencing this competition; dealers in such commodities as coal, oil, gasoline find their functions usurped by local governments. We are headed slowly but surely for the experience of Australia, which has approached bankruptcy and complete collapse of credit, he said. These perversions of government are the result of a vociferous minority dominating our legislatures. The silent majority is on the verge of expressing itself in emphatic terms. Government interference with private enterprise is paternalism. Taxation for paternalism is tyranny. An aroused and intelligent people will not permit this noxious growth to embarrass their progress and impair their prosperity.

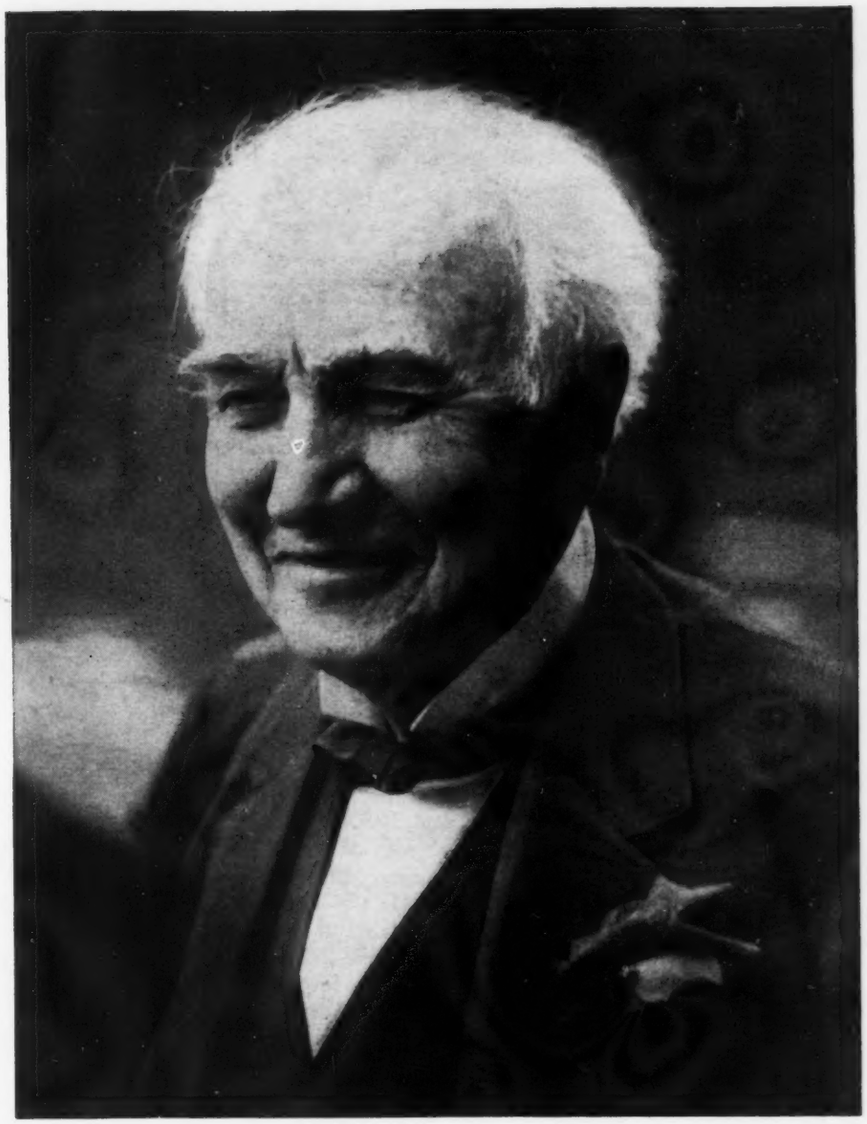
Business is stagnant because the individual business man is looking for a magician to pull a rabbit out of a hat, Mr. Groesbeck went on. As Mr. Thorpe had said, the business man is hesitant because he distrusts the tendency of government to weaken confidence in credit. Political panaceas have contributed to this hesitation. Political "kibitzers" looking over the shoulder of every industry, are suggesting plays, criticising the moves of the real participants and are looking with greedy eyes on the stakes. Every constructive move made by industry to bolster and inspire business is dampened by some political threat against that business. "We are in danger of losing the economic freedom of the individual; it is an intangible, subtle, seductive movement which by slowly whittling away our economic freedom is likewise diminishing our political freedom."



EDISON

says:

Have Faith



THOMAS A. EDISON addressed the N.E.L.A. Convention by telephone from his winter home in Fort Myers, Florida, on Thursday morning. The program, which was broadcasted, was opened by President W. Alton Jones, who said:

I ask you to pause for a moment and think of two great benefactors of the human race. We read of one of them in the mythology of the ancient Greeks. His name was Prometheus. He dared to snatch fire from heaven and bring it down to earth. For this audacious service to his fellow men he was doomed to life-long torture by the jealous gods.

America has her Prometheus. He chained the lightning. He gave the world electric light. The Fates are kinder than in ancient days. To him has been given not punishment, but honor: long life, happiness, the universal reverence of his fellow men. It is our privilege now to pay him homage. On your behalf I am about to extend our greetings to him. I invite you to listen with me to the voice of America's great citizen, Thomas Alva Edison.

* * *

Mr. Edison, this is W. Alton Jones, president of the National Electric Light Association. Seven thousand delegates gathered in convention in Atlantic City, and tens of thousands of members of the electrical industry all over the United States, have paused at this moment to pay tribute to you, whose genius laid the foundations of this industry and whose character and example continue to be its inspiration and its guide.

Mr. Edison's response was as follows:

I appreciate your greetings. My message to you is, be courageous. I have lived a long time. I have seen history repeat itself again and again. I have seen many depressions in business. Always America has come out stronger and more prosperous. Be as brave as your fathers before you. Have faith. Go forward.

Topics for Management

By W. A. JONES
President National Electric Light Association

Comparative statistics show stable industry.

Aggressive management urged in public relations and load building.

A time for ethics and for confidence.

IT IS not an accident that the light and power business has been able to go through one of the most serious business depressions the world has ever seen without serious impairment of its financial structure or great diminution of its productive earning power.

For the ten years ending in 1929 we witnessed in this country an unprecedented period of growth and expansion. To keep pace with the growth of industry and to take care of the service demands created by the new applications of electricity in every phase of our social and industrial life large investments were made. But as we analyze the situation today we find that while few industries grew more rapidly, none grew more soundly, and that of the seven billions of dollars of new capital put into this business between 1920 and 1930 very little represents duplication of investment or service facilities.

I need not remind you that it was during this period that many important things were done by the industry itself to carefully control and direct the capital investment in this business along sound economic lines. It was during this period that we witnessed many important mergers and consolidations and the regional grouping under one management of service facilities and equipment to the end that greater economies might be effected and greater utilization made of the investment already in the business. It was during this period that a great movement was fostered for the interconnection of independently owned power transmission systems in order that the surplus generating equipment of one company might be made available to serve the needs of a wider area.

Factors of stability

It was during this period that millions of dollars were employed in research and development work and in the perfection of both production and utilization equipment of the highest economy. It was also during this period that the industry put forth its greatest commercial efforts for new and better business, a further diversity of income and a more economic application of its service. All these things have tended to stabilize our business and furnish the much-sought-after explanation of why the light and power business has been able to go ahead in the last eighteen months while many other industries have been faltering and stumbling along the road of business progress.

In recent months we have heard much discussion of the so-called promotional rate. The very term used to describe this form of rate suggests something speculative in character. To me it is quite appropriate, for I am sure that many of these promotional rates have been designed to obtain business in the face of keen competition and, as designed, are unsound and dangerous.

A rate which has nothing to recommend it except cheapness and the fact that it will attract business may be harmful in the extreme. All too often in recent years we have seen straight-line cuts made in the meter rates for electricity which have very greatly increased the number of our customers who use our service as a convenience to themselves but do not pay their way. I call these customers convenience users.

Some studies have been made to determine the number of domestic users of electricity who may be classed in the convenience or non-profit group. *From the best information available it appears we now serve some six million domestic consumers at a loss, and that this loss is levied against other users of service who are compelled to pay a higher rate than they should.* After all these years of business development we should not find it necessary to consider the subject of rate forms. We are, however, confronted with the fact that there is much yet to be done to perfect our methods of charging.

Over and over again, in the promulgation of rate

schedules, light and power companies and regulatory bodies have failed or refused to recognize the fact that we are dealing in a service and not a commodity and have designed rate forms accordingly. Within a year I have heard the president of one of our member companies state that, taken as a whole, he was not able to show a fair return upon the investment in use and useful property devoted to domestic service. If this executive has made the proper analysis—and I have no reason to doubt his figures—we are safe in assuming that thousands of his customers were being served at a great loss and other thousands were being taxed to make up these losses, and that he was unable to collect enough from his profitable users to pay the toll levied by his convenience users.

This condition should not prevail; and if we are to continue to grow soundly and make the most of our commercial opportunities, we must see to it that our rates are not only fair and reasonable, but that they are so designed as properly to allocate the cost of service and encourage the widest use of that service.

In the past two decades our business has grown so rapidly that we have at times had difficulty in keeping up with service demands. As we survey our future or potential markets it is apparent that our biggest opportunity lies in the increased use of service by present customers. Millions of our domestic customers can and will in the future use five or even ten times as much electricity as they now consume. We cannot expect them to increase their use of our service to any such point if they are forced to pay the losses we incur in serving other domestic customers.

For forty years the trend of electric rates has been downward. If this trend is to continue we must adopt rate forms which will encourage greater use and better utilization of our service facilities.

Rate trends continue downward during depression

In spite of the fact that we have witnessed a reduction of 3.8 per cent in the total kilowatt-hour sales of electrical energy for the twelve months ended April 30, 1931, as compared with the previous year, we find that the average rate for electricity used in the home has shown a further decrease, due partly to the increased use of electricity for domestic purposes.

Many companies have in recent years made voluntary reductions in rates for domestic service, made possible through increased use of our service. These reductions have resulted in the savings of millions of dollars annually to the people of the country. An examination of the records shows that the amount of electricity used by domestic customers in 1930 would have cost $150,000,000 more in 1920, $300,000,000 more in 1910, $800,000,000 more in 1900 and $1,250,000,000 in 1890. While the domestic consumption has increased more than 60 times in the past 40 years, the total domestic bill of the nation has increased less than 20 times.

The total domestic bill of this nation is only $600,000,000 per year. If this total bill be divided among the more than 20,000,000 domestic users, it will be seen that the average cost per household is slightly over $30 per year, or a charge of about $5 per person per year. Some careless politicians have contended that this bill of less than 10 cents per day for the average American home is exorbitant and amounts to extortion. Some of them further contend that this is an unbearable levy on the workingman and that something must be done to relieve him of his burden.

COMPARISONS are often misleading, but it is of more than passing interest to consider an analysis, made by one of the largest statistical organizations of the country, of the reports of more than 600 corporations for the first three months of the years 1930 and 1931. This analysis shows that the first quarter's earnings of these 600 corporations this year are 38.4 per cent below the corresponding period of 1930. Of the companies included in this analysis, 259 were industrial corporations, the earnings of which, taken as a whole, were 54.8 per cent under those of the previous year; 171 were railways, which shows a decrease of 39.3 per cent, and 76 were light, power and gas companies, with decrease of only 1.6 per cent.

If this comparison is to be taken as a measure of the relative effect of the business depression on industry, it will be seen that our industry has been greatly favored. This would seem to be conclusive evidence of its diversity and stability.

Taxes are people's greatest burden

I firmly believe that the predatory politician who makes such assertions is insulting the intelligence of the average American citizen. I believe the average citizen is intelligent enough to see the great difference between the low cost of electricity and the high cost of politics. It is no longer a secret that the cost of our political institutions has become one of the greatest burdens which our people have to bear. The tax gatherers of this country are now taking a toll of over $12,000,000,000 per year from the pockets of the people of this country. This represents 20 times as much as the domestic consumers now pay for electric service. This industry alone pays in direct taxes approximately $200,000,000 per year, which represents 10 cents out of every dollar collected in gross revenue and almost one-third of all moneys collected for domestic electricity.

It is interesting indeed to make some comparisons between the trend in the cost of government and the cost of electricity in the United States. In 1913 the average cost of government per family was six times the average family electric bill. In 1928, the latest year for which figures are available, the cost of government was fifteen times the average electric bill. That means that we have now reached the point where for each dollar a customer spends for household electric service he has to pay $15 in taxes for the cost of government.

It would seem to me—and I believe that millions of other Americans share my view—that the time has come when those intrusted with the guidance of our political institutions should devote more of their time to improving the efficiency of government and less to dabbling in private business, particularly where the records show that

a private business has been able to reduce its cost consistently for 40 years.

There is another interesting thing, too, in comparing the electric bill of the nation and the cost of government. It must be borne in mind that no one is compelled to use electric service; that for centuries before this service was available to mankind some other form of energy was used in its stead for light, heat and power. It would be inconvenient for any one to dispense with the use of electric service, but it is entirely possible to do so. On the other hand, it is impossible to avoid the tax collector. For while many trick schemes have been devised by the politician to delude the people about the taxes they pay, the fact remains that, directly or indirectly, we must all share the cost of government, and in the now staggering tax bill we pay for the most glaring political inefficiency.

It would be interesting, indeed, if some of the political quacks who are so prone to criticise the light and power business could devise some means of providing free electric service for the people of this country. It is hardly likely that any of these quacks, no matter how resourceful they may be in political strategy, will ever be able to do anything of the sort. But, conceding for the sake of argument that they might accomplish the impossible, how much easier it would be for them to undertake a reduction of only 5 per cent in the cost of government. If they would do this, the total savings to the people would be greater than the entire bill they pay for domestic electricity.

Political attacks continue

During the year the industry has been made the target for further political attacks. These attacks have, for the most part, been a rehash of old drivel and political buncombe. As in the past, they have come from three main sources:

1. From candidates for political office.
2. From advocates of government ownership of utilities in some form.
3. From socialists who wish to communize all industry.

The two latter groups have no great following in this country, and there is no indication that America is yet ready to turn from the principles of private initiative in business to those of communism.

In the first group we are dealing with those in the body politic who are always crying out against large business institutions. In previous years and in old campaigns before the light and power industry attained any degree of prominence they devoted their attention to the "oil barons," to the "railroad trust," the "steel trust" and the "money trust." Their attacks on these industries have pretty well spent themselves, and the people have become tired of listening to their tirades. And so the politician is now addressing himself to the phantom "power trust."

The total number of these agitators is not large. In normal times their preachments would attract no considerable following among thinking Americans. We find, however, that in a period such as the one through which we are now passing many people are looking for quick remedies for their business or personal ills and are prone to turn to the demagogue for relief. Fortunately, the record of our industry is such that it is difficult for even a clever politician, skilled in trickery, to make a case against us if we but present the evidence to the public. We cannot afford, however, to remain silent in the face of false charges and unwarranted attacks. I, therefore, strongly urge that the leaders of this business aggressively follow up the matter of answering such attacks through public statements and paid advertisements if necessary. In my opinion the management of light and power companies will be neglecting their obligation to their stockholders and the public if they fail to challenge openly such unwarranted attacks. Certainly we are thus obligated, and our investors expect us to defend their property against the muckraker who is a parasite in every democratic government.

Evils should be corrected

If evils exist, we should correct them from within. No industry can be 100 per cent pure. Here and there we have seen mistakes and mismanagement in the light and power business. But, taken as a whole, no industry in America has done more than ours to merit the confidence of the people of this country.

The chairman of the public service commission of a Middle Western state, speaking recently before a body of public utility men, made the following statement:

"The fact may as well be faced that the public utility agitation in some states, and even nationally, has reached formidable proportions and considerable success. If the industry will face realities, it must admit that this agitation could not have succeeded as it has without some plausible foundation. The important point is that the industry has not been judged by its conscientious and efficient members, but by its 'minority of sinners.' Agitation based on the actions of this minority has resulted in some states in immature and partisan legislation harmful to the industry and to the people."

Further on in his address this same commissioner said: "A body such as this [meaning the utility association] will miss its greatest opportunity for service to the industry if it limits its activities to the exchange of information for the solution of technical problems and to making common cause in matters affecting the common interest. I believe it should pattern its activities after professional organizations, such as medical associations, bar associations and engineering societies, which lay down rules of conduct and discipline those who wander from the straight path."

This language is plain and understandable and, coming as it does from a thoughtful man with experience in the field of regulation, it should receive from bodies such as this the thoughtful consideration to which it is entitled.

If I understand the commissioner correctly, he is suggesting that we have ourselves to blame for many of the criticisms and political attacks which have been made against us. To the best of my knowledge, no other trade association in America has accomplished so much in 45 years of existence as has this association. In engineering research, in commercial development, in accounting procedure, this organization has often pointed the way. But I am convinced that far too little attention has been paid in the past to the ethical conduct of a few of our members.

I know it will be contended that in a voluntary association of this kind it is impossible to control the actions of a member. This is not a complete answer. Unless we are willing occasionally to prescribe the laxative which

will correct evils from within the business, we must swallow the dosage of the political quack who deals only in purgatives and bitter medicine.

This is a time when good management comes into its own. In the roaring, hilarious business tumult of two or three years ago ability and intelligence were at no particular premium. Over and over again we saw financial buccaneers wave a magic wand and create fortunes over night. In recent months we have seen many of these miracle workers pass. As we survey the burned-out ashes of the hopes of these dreamers, I dare say that, if we are honest with ourselves, we must admit that our own dreams were colored and our own plans influenced to some extent by their activities. I predict that if we analyze our organizations carefully in this "cold gray dawn of the morning after," we shall find many things which seem different. We should welcome this opportunity to further intrench a business which already stands on a firm foundation. In so doing, however, we should not assume the rôle of "calamity howler" and join in the anvil chorus of gloom dispensers who are now predicting all the dire things in the world.

Business has suffered a shock to its nervous system by the violation of some basic laws which govern world commerce. I am satisfied, however, that the greatest suffering in recent months may be traced to fear and timidity upon the part of normal people, who, if they but reflect, will recall innumerable times in the history of this country when we faced much darker days.

Many are crying out now for a new leadership in business. To me this seems to be a futile cry, for leaders are not made overnight. And while periods of this kind develop the stuff out of which men are made, we must look to those men who have piloted our industries through other storms to make the port in this gale. No group of men are better qualified to help lead business back to safe ground than those who have proved themselves leaders in the light and power business.

Let us therefore dedicate ourselves to this task. Let us administer the elixir of sanity in large doses, and, in the thousands of communities in which we serve, help to do those things which will extricate business from the doldrums. If we do this we shall share in the certain prosperity which will follow. If we fail, our business, which has, thus far, been affected so slightly, will feel the chill of the blast of the business winter.

Negotiated Rate Sets Precedent in Regulation

RATE adjustment initiated by the New York Public Service Commission but executed in wholly co-operative manner with the utility affected instills a much-desired reassurance concerning the responsiveness of regulatory machinery to the social and economic needs of the moment. Milo R. Maltbie went in as chairman of the New York Public Service Commission under the mandate of the Governor to humanize the institution of regulation. In his draft of the commission's decision which stipulates a new rate for New York City he has done just that. Of course, it was a formal proceeding, with the state, city, civic groups and utilities as participants; but one rightly gathers that in the last analysis the result was negotiated between Mr. Maltbie and Mr. Sloan. The latter's name appears many times in the document. The rigidity of legal phraseology is lacking throughout. It sounds more like an oral report of a public representative to an intelligent group of his constituents upon his successful conference with a third party. Nowhere does a high and mighty potentate talk in dictatorial terms to his recalcitrant victim.

The decision substitutes a minimum charge covering a few absorbed kilowatt-hours for the flat service charge proposed by the company—not because of a question as to the validity of the service charge (this is admitted) but because of psychological public aversion to it. The ruling advocates uniformity in type of rate over large areas while at the same time acknowledging necessary departures in the magnitudes of its elements under different service conditions. It frankly admits that in a promotional rate lies the future economic usefulness of electric service to the public, but also acknowledges that in this case it could not be instituted without raising the charge to half of today's customers in order that all of tomorrow's customers shall benefit. Likewise, the demand charge for commercial users finds justification in the eyes of the commission. Submetering is no more looked upon with favor by the regulatory body than by the company. "The rate schedules should be so devised as to make such resale unprofitable," observes the order.

It took courage on Matthew S. Sloan's part to propose a revenue reduction which to half his customers would look like the gift of a homing pigeon. It took more courage for the commission to brave possible public clamor by confirming the effect, if not the letter, of those proposals in order to substitute the virtue of the promotional rate for the circumscribing banefulness of the flat rate. And it took a keen sense of responsiveness on the part of constituted authority to current regulatory exigencies to short-circuit the stiffness and delay of typical regulatory procedure for the sake of accomplishing expeditiously the common aim of commission and company. New York's board and New York's company have both made a commendable contribution toward molding rate regulation into channels where the public will be disposed to abandon the doubts which politicians have cast upon the mechanism.—EDITORIAL.

In the Public Interest

By W. C. MULLENDORE

Vice-President Southern California Edison Company, Ltd.

Tear the masks from the demagogues. False doctrines and socialistic leadership call for aggressive action by Americans.

THE real issue which I find has been raised by the prevailing attack upon the electric utility industry is whether the power of public office shall be wrongfully employed to undermine confidence in and destroy the good will of legitimate American business in order to prepare the way for a program in direct conflict with basic American principles; whether it is in the public interest that the destructive forces of fear, envy, hatred, suspicion and distrust shall be aroused through false accusations, unjustified abuse and vilification of American institutions, to the end that socialism shall replace American individualism and that a few men shall be enabled to hold the limelight by posing as defenders of that which they themselves are attacking. There is also involved the broader issue of whether leadership which attempts to destroy existing human institutions through employment of the forces of hatred and appeals to the baser emotions of mankind shall in America triumph over constructive leadership which relies upon the forces of reason and appeals to calm judgment and common sense.

The business of the electric light and power industry, like that of all utilities, is clothed with a public interest. In the proper functioning of this business the public as a whole has both a broad and a deep interest. We of the industry do not maintain that we are free from fault or should be exempt from just criticism. Some of our critics are fair, honest and sincere citizens, and of them we not only have no complaint but we are glad to meet them in correction and in fair discussion of our shortcomings. We recognize the right of any citizen, public or private, to direct attention to our mistakes of omission or commission. We have, however, the right to ask and to expect that criticism shall be based upon facts and not upon falsehood, that it shall be motivated by a real interest in the public welfare and not by a disguised hatred or by a hidden purpose to destroy.

Our industry is a trustee of many interests—those of its more than a quarter million employees, its two million investors, its twenty-four million customers, and, most important of all, the basic interest of the public in the maintenance of those forces of individualism and private enterprise without which neither this nor any other great industry or business of America could have reached the present levels of service to the public. These interests we must protect if we meet our full responsibility.

Attacks unfounded

I turn to the evidence which discloses that the more vicious assaults upon these interests are not only unfounded, but so dishonest and lacking in substance as clearly to show that the motive for such attack is something other than is pretended; that there is a concealed objective, which for some reason those leading the attack do not care to avow openly.

First, the public is told by no less a person than the senior Senator from Nebraska that the power industry, which he is pleased to style the "power trust," is "the most disgraceful and far-reaching and shameful combination that has ever been organized by man"; also, that "they have never done anything except to feather their own nests and deceive the very people who by their pennies contribute to their wealth." What, in contrast, are the facts?

The electric power industry in fifty years, starting with nothing, has built the most widespread, the most generally used and the cheapest electric service found in any country on earth. This service has been of immense benefit to the people of the United States by adding to the productivity of and lightening the burden of labor, by

contributing to the joy and comfort of life in the home, and by raising the standard of living in every walk of life. Yet but for the genius of Thomas A. Edison and those hundreds of others whose vision, courage and enterprise built and developed this great industry, often in the face of great risks and under discouraging conditions, the advantages of electric service, as we know it today, would not be ours. Hence, when the Senator says that these pioneers and builders "have never done anything except to feather their own nests" he not only belittles outstanding achievement, but he betrays his own insincerity and venom.

The average light and power bill of the American home today is about $2.72 monthly. The average per capita charge for domestic electricity in the United States is about $5.25 annually, as contrasted with an average per capita expenditure of $16.50 for tobacco and almost half as much for confectionery. Half of the individual users of electricity receive service for an average cost of 12 cents a day and the other half for 5 cents. The "composite figure" for the cost of living today is still 50 per cent above its 1913 figure, while the national average cost of domestic electricity to the consumer is 31 per cent below the 1913 figure. Where in this record of rate reduction is there evidence that our customers have not been given the benefit of the improved technique which the unceasing efforts within the industry have developed? In the face of these facts how puerile is the representation, also made by Senator Norris, that this electric bill stands in the way of happiness and prosperity in millions of American homes?

What of the farm problem? The Senator is from a farming state. Are his farmers prosperous? Is it their electric bill that controls happiness in Nebraska homes or are other factors more vital? Again, the domestic electric bill in many Nebraska towns served by municipally owned plants is from three to four times the bill in similar municipalities elsewhere served by electric utilities under private management. Why does not the Senator concern himself with these barriers to happiness in his own state?

The deficit facing the United States treasury in this fiscal year is estimated at a billion dollars. Our Post Office Department alone is running at an annual deficit of almost $150,000,000, or one-fourth of the nation's domestic electric bill. If a senator is really concerned over fractional savings in 2 per cent of the household budget, might he not consider the cost to the taxpayer of the dissemination of public ownership propaganda through the use of the Senator's franking privilege?

Real problems overlooked

The world is struggling under a burden of debt, and world commerce is vitally connected with such problems as armament and tariffs. Would not a really progressive statesman find that these problems compared in gravity with that presented by the power industry?

If the electric light and power bill were reduced by 10 per cent it would mean less than one cent per day to the average American householder. Why does this item absorb the attention of that group of United States senators and those governors of great states who maintain that electric light and power is the greatest issue before the people of the United States today?

When we recall these greater problems, does this ridiculous exaggerated concern about the light and power industry emanating from senators of the United States represent statesmanship or does it indicate an utter lack of comprehension of either the dignity or responsibility of the office.

Why "power trust"?

Why the insistence upon and constant employment of the term "power trust" in the face of the repeated demonstration of its falsity and the finding of the Federal Trade Commission of its non-existence? Why the emphasis upon water power and use of natural resources in the face of the fact that only one-third of the supply of electricity comes from water power and that the proportion of steam power is constantly growing? Why the representation that water power costs nothing because it is supplied by Nature, when the facts are that it costs more than steam power because it requires the use of more ingenuity, skill and capital and involves greater risks? Why the constant misrepresentation that electric service is non-competitive, when every kilowatt-hour sold for power is sold under either actual or potential competition? These canards are obviously reiterated because they furnish a basis for sensational and fervid oratory and lend themselves to the arousing of prejudice, fear and distrust.

Gifford Pinchot, the Governor of one of the greatest commonwealths in the United States, in his inaugural address, asserts that:

> Back of the public utilities in their attack on our American form of government is the whole fabric of political corruption, the underworld, the protected racketeer and criminals of high and low degree.

That takes in quite a bit of territory. First we are accused of attacking the American form of government. The American form of government is under attack by socialists and communists. We are believers in individualism—the opposite of socialism and communism. To accuse an opponent of your own offense is an old device for fooling the public.

Political corruption charged

Next, we are accused of "political corruption." That is a serious charge. It is significant that it is made impersonally against an entire industry which has no legal redress. If Governor Pinchot has knowledge of individual instances of corruption so generally distributed throughout an industry as to indict that industry, he is in contemptible neglect of his duty not only as a governor but as a citizen when he does not proceed criminally against the corruptionists who work in his state. The Governor's very neglect to do this convicts him of a demagogic attempt to arouse hatred of something that does not exist.

The Governor says "the protected racketeer and criminals of high and low degree" are "back of the pubilc utilities." Is the Governor so fearful of the power of these criminals in Pennsylvania that he dares only to assault the vicious alliance with words, or has he merely searched the dictionary for epithets with which to assail a legitimate industry that serves the public with a necessary commodity more efficiently, more cheaply, with better service, and probably at lower rates of return on actual investment, than is the case with any other large-scale successful business in the world? Is the Governor actuated by patriotism or by malice? The slightest reflection will permit every citizen to answer this question.

I have particularly named two leaders of our vitriolic

critics because these men are recognized spokesmen for the self-appointed "anti-power" group, and it is evident their tactics and their utterances have the indorsement of their group. Allied with these two leaders in their insistence upon a power issue are other senators, such as Brookhart of Iowa, Wheeler of Montana and Dill of Washington; other governors, such as La Follette of Wisconsin and Meier of Oregon; many prominent members of the Socialist party and its offshoot, the League for Industrial Democracy; propaganda organizations with headquarters in Washington masquerading under patriotic titles, such as the People's Legislative Service and the National Popular Government League, and last, but not least, the Public Ownership League of America, under the direction of Carl D. Thompson, formerly campaign manager and manager of the information bureau of the National Socialist party.

Avowed aim socialization of industry

Now, how does it happen that the leaders of the attack upon the electric utilities are so closely allied with those whose avowed aim is the socialization of this industry as a first step toward socialization of all basic industry and the "elimination of the profit motive in private enterprise"? How does it happen that they follow the same program and deal in the same untruths or vicious half-truths and gross exaggeration unless they have the common aim of advancing that common goal of socialism and communism—political ownership of all basic industries? Some of these who are insisting on a power issue are doing so not because they have any particular dislike for our industry but merely because they believe that baiting public service corporations is good political self-service; but that the leaders are using these tactics to prepare the way for their ideal of socialization admits of no doubt.

We do not accuse them of being socialists; they accuse themselves by their alliances. Then, why not be honest about it and present their real proposal openly and on its merits? Not only have we no fear of honest criticism, but we recognize the right of any citizen who prefers political ownership to advocate his cause. If widely diffused private ownership under public regulation is wrong, if the wrong conclusions have been drawn from the historical failure of political ownership, and if this discredited system is in the public interest, why do its proponents not give the public facts instead of basing their case upon falsehoods about their opponents? Why not explain the reason for disaster under widespread public ownership in Australia? If their system is such a blessing, why not explain why the city of Berlin has abandoned it after so many years of trial and at a time when Berlin needs all the magical saving claimed to be inherent in political ownership? Why not answer the challenge that all politically owned enterprises which claim a saving achieve it through freedom from taxes and other charges which they conceal by dishonest accounting? Why resort to unfounded accusations that do not inform but only arouse prejudice? Is it not because they know that to succeed in their real aim they must first, by whatever means, undermine public confidence in, and thus destroy the most valuable asset of, individual initiative and private enterprise as exemplified in a leading industry?

What, then, is our duty? Is it fulfilled by simply attending to the management of our properties, improving our service and reducing its cost? I venture the opinion that it is not; that our duty requires not only an exposure of their misrepresentations but of the true motives and character of these impostors who, under the guise of serving the public interest, are in fact doing their utmost to injure the public interest. If a citizen knows of the existence of a pyromaniac in a community, duty as a good citizen is not wholly fulfilled by putting out the fires as they are started. Duty is not fully performed until the firebug is exposed and restrained from starting more fires. When a malicious slanderer attacks and attempts to destroy the good character and reputation of a citizen, the individual so attacked is not properly protecting either his own interest or that of the public by limiting himself to denial of the slanders which are spread against them. He must take action to prevent the slanderer from slandering others.

I am aware that the task of tearing the mask from these demagogues is not a pleasant one. I am aware that the advantages of mediums of publicity including public forums and the franking privilege are with our enemies. I am also aware of the contention that it is poor judgment for those connected with public utility corporations to raise objection to wholly unfair criticism by public officials because it tends to confirm their charge that we are unwilling to co-operate in the elimination of our faults or the correction of our mistakes.

With all due respect to this point of view, I submit that it surrenders the field of public controversy to the demagogue and leaves the uninformed public defenseless against his trickery. We are public servants. We are neither disfranchised nor relieved of our duty as citizens by reason of public utility employment. On the contrary, our obligation in this situation is greater because we are utility employees. Some one must assume responsibility and leadership in checking malicious destruction of the interests which we hold in trust. Who will lead, if not those who know the truth and who have the primary responsibility in advising the public of the truth?

Builders will defend industry

I furthermore believe that truth is stronger than fiction and that the men and women throughout the rank and file of this industry whose courage, vision, loyalty and devotion have builded the electric utilities into the great institutions of public service which they are today are anxiously awaiting the call to action against attempts to injure or destroy these institutions to which their lives have been devoted. Let the leaders of the industry issue the summons and these men and women will effectively employ the weapon of truth in removing the mask of honesty, sincerity and devotion to the public interest upon which our enemies rely for their strength.

I am not alarmed as to the immediate fate of the electric industry in the face of these attacks. The essential soundness of this industry, its record of service and accomplishment under private management and public regulation, will enable it to withstand the prevailing assaults. The real threat is not so much to our industry as to basic American principles. We are only for the moment in the first line of defense. Others will follow us as others have preceded. The peril is that the American people will be dominated by or follow the leadership of those who employ the weapons of hatred for political gain and for the advancement of theories which strike at the roots of American institutions.

Trade Relations

World-wide depression springs from distribution maladjustments. Co-operation points way to progress. Taxes and elimination of waste two current problems.

By J. F. OWENS
President Oklahoma Gas & Electric Company

WE HEAR much talk these days about a world economic crisis, and it is rapidly becoming the fashion to place the responsibility for any and all of our difficulties and our failure to solve them on the existence of this crisis. It would seem as though we never had had any problems before the present serious situation settled down upon us like some great international fog, recognizing neither geographical nor national boundaries. It seems to me that a vast amount of energy is being spent in trying to fix the blame for unemployment, overproduction, underconsumption, disturbances of international trade balances, or whatever other glittering generality we may choose to employ in describing this world-wide situation, and not quite enough in diagnosing some of our own ailments and their relation, if any, to world affairs.

I may be wrong, but it seems to me that no one is making any effort to get down to what I call the "grass roots" of our difficulties. If this be done, we shall very quickly find that most of our problems which seem to be the outcome of some intangible, but nevertheless very real, world-wide economic crisis can be resolved into one very simple problem which is not new but which, for the moment, is all dressed up in new clothes with no particular place to go, and which, therefore, is trying to go every place at once. It is the problem of distribution, which, in this country at least, is becoming more and more acute, affecting not only every man, woman and child in the United States but every man, woman and child throughout the world. It becomes the nightmare of the retailer, wholesaler and jobber alike, creating failures, unemployment, overproduction (which means more unemployment), underconsumption and all of the many ills which accompany a period such as we have been passing through.

We in the electrical industry are faced with a specific problem which is just one phase of this problem of distribution. What is our portion of the problem? It is nothing more or less than the merchandising of electrical appliances for use in the home. It affects directly the light and power industry, the electrical manufacturers, wholesalers, jobbers, retail dealers, contractor-dealers, and last, but most important of all, the consumer of electrical energy, who also provides the market for those electrical appliances which are operated by electricity. I say "most important of all," because if we do not approach this problem from the point of view of the folks in the home we shall have disregarded the controlling factor in any equation we may set up for its solution.

I propose to face the issue quite frankly and say that this problem is created by the fact that the electrical wholesaler, retail dealer or contractor-dealer sees himself and his business becoming only a forgotten page in the history of American industry because of the fact that the central station is merchandising and installing electrical appliances. The business of the light and power company is to generate and distribute electrical energy, they say. That is what it was organized for, if you please, and it is for that purpose that the people of the state have granted it the right to engage in business. With this in mind they have frequently appealed to the courts and the state legislatures for decisions and laws prohibiting the central station from doing these things.

Utility-customer relations intimate

If this were entirely true, and if we could stop there without going any further, then there would be no problem. Unfortunately, the customer of the light and power company has a curious psychology with regard to electric service which prompts him to hold the company responsible not only for the quality of its service in so far as electrical energy is concerned but also for the effective operation of the appliances which he attempts to use in his home. If these appliances do not function

properly, he is very sure that the company is sending second-grade electricity over its lines, and he immediately demands that something be done to make them do the work which they were intended to do, and do it well. The company wants the appliance to work well so that it will remain on the line and continue to consume energy; it cannot dodge some measure of responsibility without destroying its friendly relations with its customers.

So, while the light and power company may not have been organized to go into the retail business of selling toasters, curling irons, vacuum cleaners, refrigerators and what not, this domestic equipment does present a problem which is quite as serious to the central station as the problem of central-station merchandising is to individuals who have set themselves up in the business of selling and installing them. In some communities it has been forced to go into the business by a flood of substandard equipment giving unsatisfactory service for which the central station has directly or indirectly been blamed. In others it has been forced into the business by local circumstances which made it impossible for local dealers to supply the market properly or properly service the equipment once it was installed. *There may be a score of reasons for central-station merchandising, but among them I do not find the primary motive to be the retail profit central stations might enjoy from the sale of equipment.* The one idea has been to get satisfactory standard appliances on the line so that the customer would use more electricity—the central station looks upon an appliance as a consumer of energy and not as a commodity which it can sell at a profit.

What is the answer? What are we going to do about it?

We are faced with alternative solutions, and these alternatives apply to a solution of the entire problem of distribution in this country or any other country.

Two solutions available

The first is legislation. Those who lean toward this solution think that by passing a lot of prohibitory laws and enforcing them they will immediately find themselves in some Utopia of prosperous business conditions, without stopping to find out what effect those laws may have on other people or to consider that if this effect is unfavorable it may prevent the very result they seek to accomplish. In other words, they are not thinking of the consumer but only of their own cash registers. They are not thinking of other groups within the community or the state or the nation that have the same problems of distribution but only of first-at-hand means of self-preservation.

It can be accepted as a fundamental fact that legislation never cured any business depression or economic crisis. It has never provided employment for the unemployed or saved the insolvent from bankruptcy. It can only put food in hungry mouths by appropriations from the public purse, and the public purse is not inexhaustible even though certain types of politicians may think so. It cannot stop the operation of the law of supply and demand any more than it can stop the operation of the law of gravitation. It can exercise its police power and protect the public from exploitation by dishonest business methods, but it cannot solve the problems of honest men engaged in honest business. When it tries to do any of these things it only succeeds in making a general mess of everything, thus adding to the distress.

The second alternative is co-operation, and it is this alternative which has been selected by the various groups most vitally interested in electrical merchandising. They have organized the Electrical Merchandising Joint Committee, members of which are on this platform with me now, and by this simple piece of machinery are already approaching the solution of a nation-wide problem and thus contributing to the only sane and sensible method of approaching the larger problems with which the people of all the world seem to be faced, namely, a way out of our economic ills which has no return lane of traffic.

The joint committee is composed of representatives of the National Retail Dry Goods Association and the National Electric Light Association. Its purpose, as stated in the *N.E.L.A. Bulletin* at the time of organization, "is to consider the problem of merchandising household electric appliances from various aspects with the view of wider, more efficient and more effective distribution with the public's best interest in mind." I wish to emphasize the last few words because upon their sincerity rests the future success or failure of the efforts of this committee. Whatever conclusion they may reach, whatever recommendations they may promulgate, whatever action they may take, all are based on that easily understandable phrase, "with the public's best interest in mind."

Bridge from producer to consumer

"Co-operation" is the keystone of the arch which the electrical industry—and in the term electrical industry I include every one, from the smallest retail dealer to the largest manufacturer, who has anything to do with the distribution of electrical energy or the appliances which it operates—must build to bridge the stream of faulty distribution which so often flows between the producer and the ultimate consumer. Co-operation always works when men sincerely adopt it.

It was with this fact in mind that the officers of the National Retail Dry Goods Association requested, in the first instance, the conference with executives of the light and power industry which led to the formation of the Electrical Merchandising Joint Committee. Recognizing that our problems are mutual because they deal, after all, with the same ultimate consumer, they had but one thought in mind—their solution in the public interest. The result has been that already this joint committee is setting up the necessary machinery to correct trade practices that do not square with ethical merchandising principles. Co-operating committees will be set up in every state and in all of the major cities. These committees will be active, working committees and not simply a list of names on the chart of some new high-sounding paper organization which accomplishes nothing more than a graceful gesture. There are already too many organizations of this kind, wasting good white paper and ink which might be better employed for other purposes.

To cite an instance of a concrete problem which may very well come within the scope of this joint committee, for it is a serious problem confronting all producers and distributors, there is the question of taxation. Inasmuch as all taxation eventually rests on the ultimate individual consumer, tax trends affect our whole economic structure. Today central stations are paying approximately 10 per cent of their gross incomes in taxes, which, of course, is reflected in the rates to the consumer. Manu-

facturers of electrical appliances pay all sorts of federal, state and municipal taxes (the aggregate of which is not growing any less if we are to believe government reports and budgets) which they pass on as far as possible to the jobber and wholesaler. The jobber and wholesaler pays the same sort of taxes, which he, too, passes on, as far as possible, to the retailer, who, in turn, has his taxes, which must be added to the price tag on his goods.

Once more I point to the fact that no one is so well fitted to deal with this problem of taxes as the distributor who has direct personal contact with the consumer. No one but a distributor of electrical energy could possibly understand how a production tax of, say, 2 mills per kilowatt-hour could possibly affect the bill of the average domestic consumer, who, I remind you once more, provides the market for electrical appliances. The average domestic consumer in the United States uses 550 kw.-hr. a year, and 2 mills would make a difference of less than 10 cents a month on this average bill, an amount which would not be worth the time of calculating on the majority of bills.

But it may easily be a very serious matter to the average domestic consumer, and, as five states have already passed such legislation, I propose to explain why. Such a production tax, no matter how small, must affect the cost of industrial or wholesale electricity. At present, as everyone knows, the margin between what the central station can charge for wholesale electricity and the cost of the same amount of electricity to the manufacturer who installs his own generating plant is very narrow. A slight production tax may wipe this margin out entirely.

Now, while there is little profit in wholesale electricity, it does absorb a very considerable portion of the fixed charges of the central generating station because much of it is furnished during off-peak hours. Anything which may have a tendency to drive the wholesale consumer to consider the expediency of generating his own power has a tendency to eliminate this absorption of fixed charges from the picture and add them to the domestic consumer's bill. Thus any tendency to add a production tax to the light and power industry, which is already overburdened with taxes, may easily affect the sale of appliances by placing the cost of operating them beyond the reach of the pocketbook of our average consumer. It, therefore, becomes a problem of both the distributor of electrical energy and the distributor of electric appliances as well as of the domestic consumer.

Elimination of waste

There is another interesting and most important application of the co-operative machinery which this joint committee is providing for, and this is the manner in which it might easily be utilized in the elimination of wastes all along the line from the manufacture of appliances to their use in the homes of consumers. Certainly the distributor, whether the distributor be a central station, a contractor-dealer or a department store, has the best opportunity to gage accurately the probable needs in his field and to estimate the number and quantity of each appliance which it will absorb within a given period of, say, twelve months.

This information would be invaluable to the manufacturer, assisting him, as it would assist him, in planning his stocks of raw materials and parts; eliminating an unnecessarily high inventory in order to be prepared for unforeseen demands, and leveling out his processes of manufacture so that they will be no longer marked by seasonal characteristics—all of which means the reduction of costs borne by the consumer. There is no reason why this information cannot be easily made available to the manufacturer, and it most certainly comes within the scope of the Electrical Merchandising Joint Committee and the machinery of the allied organizations which it represents.

It sounds simple enough when one comes to think of it. The electric light and power industry, vitally interested as it is in the quality of the equipment attached to its lines, and knowing that once this equipment is installed the central stations will be called upon for service and will in effect be held responsible by the customer for its proper operation, might, had it been sufficiently short-sighted, have solved the problem long ago in so far as its immediate interests are concerned. With its financial resources and its lack of interest in merchandising as a profit producer, as well as its immediate contact with the consumer, it might have plunged into a merchandising war with everybody engaged in the retailing of appliances and driven its competitors from the field in a very short time. Had it done so, it would have shown a deplorable lack of interest in the ultimate consumer and in the community; for such action would have affected the prosperity of more than one group of people, and anything which affects the prosperity of one or more groups affects the prosperity of the community as a whole. Incidentally, it would have been a very foolish policy, for the welfare of the public utilities is bound up with the welfare of every single group in the community served.

Service goes beyond meter

It must always be remembered that complete electric service on the part of the light and power company does not stop with the delivery of electrical energy at the customer's meter in his cellar. The company has a very important obligation in addition, which is to point the way to the multitude of uses for that energy. The customer looks upon us as specialists, and he expects us to tell him just how he can take advantage of these kilowatt-hours—electrical servants—which we place within his home and put them to work for the comfort and convenience of himself and his family.

So all of the groups, including the central stations, being made up of sensible men, have met together to solve a mutual problem and with a common objective—the welfare of their customers, the conservation of which means the conservation of their own welfare. The problem becomes no longer a problem but a question of agreement on procedure—not a very difficult matter when men are sensible.

If the electrical industry can compose its difficulties in the interests of all groups and of the public without the aid of politicians and a variety of radical agitators, why cannot this whole national economic problem of distribution be solved in exactly the same way? There is no excuse for overproduction or for underconsumption in this country. We can very easily consume all we produce once we get this troublesome matter of distribution behind us and have learned how to control the consequences of our rapid advancement in the art and science of production.

It may very well be that the situation within our own

industry provides an opportunity for leadership which may ultimately bring about a nation-wide movement throughout all industry to set up the necessary machinery for the solution of all problems of distribution, eliminating wastes and reducing the cost to the final user of the products of industry. I need not elaborate on the possibilities of such a procedure. In our own case it must result in the more complete utilization of electrical appliances as well as a larger employment of electric service. Taking the broader viewpoint, it means the solution of the one great and as yet unsolved problem in our economic structure—the problem of bridging the gap between the producer and the consumer of his product.

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Publicity and Advertising Problems

By JOSEPH B. GROCE

Chairman Advertising and Publicity Committee

Most of us feel, I think, that the main reasons for the continuous attacks on our industry are political, socialistic or communistic. Nearly two years ago we told our story on socialism and communism in the Red Book, which we published and distributed widely through the country. It is the belief of many of us that political attacks can usually best be met through local advertising by local companies rather than by advertising sponsored by the national association. Striking examples of this local advertising have been published during the past year in Iowa, Colorado and, more recently, by the Philadelphia Electric Company in Pennsylvania.

Although there is not entire agreement among our chief executives on this policy of local advertising by local companies, rather than a national advertising campaign under the name of the National Electric Light Association, there is, I am very sure, a definite feeling that our policy in the future shall be to answer vicious attacks.

Fear has never been a factor in the development of the electric light industry during the fifty years of its history. On the contrary, the men who have made this industry great have been absolutely fearless in their vision, or these United States would never have been what they are today; to say the least, the most comfortable place to live and work in there is in the world.

No self-respecting man likes to be maligned, no executive of a great industry such as ours takes any great pleasure in having his industry so viciously attacked as ours has been during the past two or three years. No human being is perfect—no great industry, either—but this industry of ours, as an industry, is honest, is square, is fair in its dealings with the public. It is not a trust, and for the best interests of the people of these United States it should continue to be privately owned, not run by the government.

If the judgment of the men who make up this National Electric Light Association is worth anything, there is no fear that the people of these United States, who have the final say-so in these matters, will decide as a nation that they want to change to government ownership of the electric light and power industry.

Prize Awards—1931

H. M. Byllesby Prizes

FIRST PRIZE: "Increasing the Accountant's Usefulness," H. D. Anderson, American Gas & Electric Company.

SECOND PRIZE: "How to Increase the Usefulness of the Accountant in the Public Utility Industry," Carl G. Willard, Carolina Power & Light Company.

THIRD PRIZE: "How to Increase the Accountant's Usefulness," George Borke, Syracuse Lighting Company.

Augustus D. Curtis Award

M. F. Cushing, New Orleans Public Service, Inc. Honorable mention—El Paso Electric Company, Brooklyn Edison Company, Northern States Power Company.

James E. Davidson Prizes

FIRST PRIZE: "Merchandising Power," L. G. Cannon, Commonwealth Edison Company.

SECOND PRIZE: "Starve the Wolves," H. M. Stark, Electric Bond & Share Company.

THIRD PRIZE: "Co-operative Merchandising as Applied to Utility Markets," D. F. Conger, New York Power & Light Corporation.

Henry L. Doherty Prizes

"A Primer for the Light and Power Industry," A. F. Tegen, Milwaukee Electric Railway & Light Company.

B. C. Forbes Cup

The Virginia Public Service Company.

James M. Gilchrist Award

Indianapolis Power & Light Company.

Martin J. Insull Prize

Daniel Ravenel, Jr., South Carolina Power Company.

James H. McGraw Prizes

FIRST PRIZE: "A Proposed Type of General Purpose Distribution System for Moderately Loaded Areas," G. H. Underhill, Central Hudson Gas & Electric Corporation.

SECOND PRIZE: "Profitable Rural Distribution," Maurice J. Kelly, Shawinigan Water & Power Company.

THIRD PRIZE: "Unique Auto-Transformer Solves Angular Displacement Problem," A. Haefle, Toledo Edison Company.

The Job Ahead

By HARRY REID
Chairman Public Relations National Section

Redouble efforts to build demand and build capacity.

Sell equipment and sell securities with full public confidence.

Future depends upon public relations.

THE problems of our industry have been stated and restated on many occasions and by many speakers. As a result, they have perhaps come to seem even more complicated than they actually are. But, reduced to simplest terms, most of them fall under two headings. To one or the other the work of every member of this audience is directly related.

The first of these is to *build demand* for our service. The second is to *build capacity* for meeting that demand. The words seem simple and a bit prosaic,—"building demand" and "building capacity." But behind them you can see, in an unfolding panorama, the future of our industry. You can see the regrouping of companies into stronger operating units, the building of far-flung transmission systems, the rearing of huge power plants with new efficiencies. And, finally, you can see a network of copper wires—branching out to every factory, farm and home in the United States—bringing energy for a thousand uses, many of which are still undreamed of.

That is the vision. It would be easy to go on speaking of it in visionary terms. But, instead, I should like to discuss a few of the practical problems which it presents. If our industry is to grow as we know it can, we must redouble our efforts to *build demand* and to *build capacity*. Expressed in simplest terms, building demand means selling equipment. Building capacity means selling securities. Can we do either of these successfully without the full confidence of the public?

I believe most firmly that we cannot. Every appliance sold, every security sold, represents a transaction between a company and an individual. It is in terms of these millions of human beings that we must consider our future development. Our securities may be sound, our service may be excellent. But there are other securities and other services. People will buy ours freely only if they have confidence in us, if they have respect for us, if they like us.

In other words, it is our job to make a friend of every customer and every investor. In this respect public relations activities, properly planned and executed, can be of tremendous practical value to every company. They can correct some misunderstandings. They can prevent others. And so, by holding old friends and winning new ones, they can make clear the road for continued development.

For many years we have watched our industry grow. We have seen the number of customers swell from 4,000,000 in 1912 to 24,000,000 in 1930; in the same time we have seen the capital investment grow from $2,000,000,000 to $12,000,000,000. Such growth, based on millions of separate transactions, is a monument to public confidence. The security holders had faith in our integrity and ability. The customers had confidence that our rates were fair and our service reliable. At the present time there is no visible limit to the expansion which lies before us. The United States already leads the world in the development of electric power. In the future it can advance to still greater heights. But if this development is to take place, confidence in the electric industry, under private ownership and operation, must be maintained.

Capital is needed

I have said that selling securities depends on confidence. Capital must be raised in markets which are keenly competitive; investors do not have to put their money into our business unless they choose to do so. Today the securities of power and light companies enjoy a high credit rating. Investors have confidence that these companies will be allowed to enjoy steady growth and earn a fair return. But if anything should arise to shake that faith, they will not hesitate to invest their funds elsewhere. The cost of money is an important element in the cost of light and power, and any injury to the

industry's credit standing will seriously handicap future development.

It is perhaps less apparent, but the market for electric service is just as competitive as is the money market. We are often apt to think only in terms of domestic lighting, and here, it is true, electricity has become a necessity. In every other field electricity is fighting for its life with other forms of energy. A domestic customer will not hesitate to install a gas range, for example, if he feels he will receive better service, lower rates and fairer treatment from his gas company. Nor will a power customer delay long in installing his own power plant unless he is confident the electric company will give him better service than he could supply himself.

These fields are the very ones to which we must look for further expansion. Domestic lighting load is still far from saturation, it is true. But it is in the competitive fields—commercial and industrial power and the major household appliances—that the greatest increases are still to come. If they are to come, the public must have confidence in us and in our product.

I have purposely discussed these matters at some length, for today, I believe, we are faced with a systematic attempt to break down public confidence. I do not need to describe in detail the political happenings of the past twelve months. You are familiar with the elections in New York, Pennsylvania, Wisconsin and Oregon. You have read of the bitter controversies in Congress over Boulder Dam and Muscle Shoals, the Federal Power Commission and regulation of interstate power. Both in Washington and your own state capital you have had a chance to hear heated debates, filled with fantastic charges against our industry.

At the present time I am not so much concerned with the actual legislation which may result. But I am very much concerned with the effect which all this bitter and baseless agitation may have upon the thinking of our investors and our customers. I am thinking of the customer who refuses to buy an electric range because he believes the rates of his company exorbitant and unfair. I am thinking of the investor who refuses to buy power and light securities because he thinks the electric companies are soon to be legislated out of existence.

What is the nature of these attacks? And why are they being made? In planning our public relations work we must consider all these questions.

Industry has creditable record

First, let us look at the record. As an industry, I think we can justly claim to have done a big and constructive job, and to have done it well. The record speaks for us—electric service has everywhere been extended and improved; its cost has been reduced, and the result has been tremendous social and economic benefits to the country. Between the years 1913 and 1930 the cost of living rose 57 per cent; the average cost of electricity in the home was reduced 31 per cent. Today it amounts to less than 1 per cent of the average family budget. At the same time the industry has shouldered an increasing share of the nation's tax burden, and in 1930 the figure stood at nearly 10 per cent of the total gross earnings.

This is a record which would seem to indicate public service in its best sense. But that is not all. It has been added to by the activities of the industry during the past year. "In a quiet, non-spectacular way," says one nationally known financial writer, "the public utility industry has done more to stabilize and support business conditions in 1930 than any other industry." He describes the achievements of the electric industry in maintaining wages, empoyment and construction levels at a time when general business was 27 per cent below normal, and then adds: "The utilities have shown themselves a veritable economic life-saver in times of depression."

Thus, the industry has shown a sincere desire to share in the responsibilities of American citizenship. It has shown this desire in acts as well as words. New power plants and transmission lines in every state from the Atlantic to the Pacific stand as monuments to the industry's good faith. This record, I believe, has won the confidence of most of our customers and investors. But it has done so in the face of hysterical abuse from radical politicians. Their charges have been taken up and distorted still further by certain newspaper chains and spread throughout the country. Like an acid, they have tried to eat away the public's confidence in us, to destroy its willingness to do business with us.

Attacks have ulterior motives

What is the force behind these attacks? With every desire to be fair, I cannot help but feel that many of them are nothing more than cheap political expediency. In case after case bills have been introduced and investigations proposed simply for the sake of personal publicity or political advancement. At any time such stratagems would be contemptible, but never more so than at the present time. For today there are problems facing our country which call for all the character and intelligence we can muster, problems related to unemployment, the tariff, farm relief, law enforcement and the rising cost of government.

These problems are hard and complex, and perhaps for that very reason the demagogues have chosen an easy way out. By reckless and irresponsible charges they are seeking to stir up a war of words, hoping to obscure all other issues until after the next election.

Ordinarily the personal motives of politicians should be of no concern to us. But when, as a selfish and temporary expedient, they seek to wreck a great industry, it becomes a matter of great and immediate concern. Then we must face their charges. We must oppose their efforts with every force at our command. It is for us to maintain public confidence so that future deveopment may continue unchecked.

That has been the objective of the Public Relations Section. Throughout the past year we have worked to give the public the facts about our industry. Whenever and wherever possible, we have sought to correct false and misleading statements. I believe that the industry has been more articulate this year than ever before. Member companies have co-operated fully to meet unjust attacks with prompt and effective answers. This has been done directly by the executives through advertisements and other mediums. Even more important, it has been done by the employees in their daily contacts with customers. In this latter field valuable training has been afforded by the employees' speaking contest, the employees' information committee, the women's committee, and other departments of the section. But the real work of public relations has barely been started.

Group Teamwork

Development of the domestic market requires sincere co-operation.
Function of each group defined.
Agencies available for joint action.

By MARSHALL E. SAMPSELL
Vice-President National Electric Light Association, President Society for Electrical Development

WE OF the electrical industry have long been aware of the value of co-operation. We have realized that the problems of each branch of our industry differ in kind and degree from those of the others. The fact that our light and power companies must rely for their right to do business in any given locality on municipal franchise and other privileges and are subject to regulation by state authority in respect to the general conduct of their business often makes it extremely difficult for that branch of the industry to conduct its affairs as independently as would otherwise be possible. Indeed, the companies have found it impracticable at times to do full justice to what they conceived to be their responsibilities and at the same time be proportionately helpful to others whose work, properly done, redounds to our common benefit.

Few of us have perhaps ever seriously attempted to form a mental picture of the electrical industry in its entirety. What are the spokes within the electrical wheel, and which spoke is the most important? Central-station people are perhaps too apt to conclude casually that the generation and distribution of energy is the all-important spoke in the electrical wheel. The manufacturers of electrical equipment, on whose successful research and development work the electrical industry must depend, quite naturally and properly see another equally essential spoke in the electrical wheel. The contractor-dealers rightly consider themselves an admittedly indispensable spoke in the electrical wheel. To these important spokes must be added the electrical supply jobbers, whose activities have always had a stimulating influence in the industry. Each of these "spokes" within the electrical wheel is represented by a well-organized association, conscious of its rights, desirous of protecting its interests, and yet willing to work in harmony of thought and action for the advancement of co-ordinated industry purposes. The electrical industry has been especially assisted by the trade papers. Their influence, both within and outside the industry, has been of special value to all concerned.

Willingness to work in harmony for the development of the electrical industry is one thing. The fulfillment of that good intention is quite another. How difficult of accomplishment any joint industry undertaking really is can be somewhat appreciated when we stop to recall that more than a million men and women are actively engaged in faithfully meeting the increasing demands of the public upon the industry. A most casual generalization of the total investment involved, gross amount of business done, salaries and wages paid, easily serves to convince clearly any student of affairs of the difficulties involved in agreeing upon and working out plans that appeal to each branch of our industary as susceptible of being put into effect with advantage to all.

All branches of the electrical industry doubtless fully appreciate that if the industry as a whole is to remain an agency for constructive achievement, we cannot contentedly rest on our oars in proud retrospection of past performance. It is clearly the job of each branch of our industry, and certainly not the responsibility of any one branch, to employ every legitimate means of intelligently educating the public everywhere to a broader and better understanding of the value to it of a greater and more diversified use of electric service and of suitable energy-consuming devices, properly designed to enable them to so use such service. This will result in rate advantage to the public and satisfactorily develop a maximum volume of electric appliance sales that will be proportionately enjoyed by manufacturers and all classes of merchandisers of labor-saving and convenience services.

Creating customer acceptance and demand

The question naturally arises of how we can most effectively awaken the public to a proper appreciation of the labor-saving, convenience and profit advantages of electric service appropriately applied in the American home. There is much said and written on this live, important subject, and seemingly equal debate as to what agencies should be employed in marketing electric household equipment. Most central-station companies

believe responsibility to their customers, investors and the public generally does not end with the production and distribution of the kilowatt-hour, but that extension of complete electric service to the public necessarily embraces responsibility to sell electric appliances to their customers and to inform them properly respecting the cost, quality standards, performance and market acceptance of electric utilization equipment of every kind and character. The light and power companies that hold this view regarding their over-all responsibility in rendering electric service know also that a maximum volume of appliance sales can never be satisfactorily developed unless there exists a thoroughgoing, cordial understanding among all classes of merchandisers.

Indeed, a monopoly of the right to generate and distribute in any given territory mankind's most flexible and helpful servant, the kilowatt-hour, does not and should not carry with it the right, nor should it create the desire, to monopolize the appliance business. Sales programs of central-station companies should be, and fortunately for the most part now are, built around the idea of encouraging and assisting other vendors of electricity-consuming devices. This spirit of group teamwork should have and has had the approval and support of the manufacturers, dealers and others within the industry. It should have, and when thoroughly understood will undoubtedly have, approval and support of department stores, furniture, hardware and other dealers.

It is generally conceded that maintenance of a high standard of service is the principal prerequisite for market building. It is also agreed that mere availability of dependable electrical energy will not suffice. The public must be afforded a maximum availability of energy at rates economical for both consumer and company. A high standard of service at rates economical for both consumer and company cannot prevail in the absence of reasonably priced wiring adequate to permit the consumer full use of electric appliances for all purposes. It is therefore plainly evident that the several branches of the electrical industry must strive together to bring about as rapidly as possible adequate wiring of the factories, stores and homes of this country. From experience we know this is no easy task. In fact, the wiring situation has long been and still is complex. We will perhaps all admit there has already been too much planning and too little definite action in dealing with this most vital question. The solution of the wiring problem can be worked out through whole-hearted group teamwork.

Competition for the consumer's dollar

We of the electrical industry know that the demand of other industries for an increasing part of the consumer's spending margin is becoming everywhere most persistent through numerous forms of carefully prepared advertising and publicity. If the industry is to retain its enviable reputation as an agency for national promotional activities, it must take full advantage of cooperative planning and mass selling action. To do this there must be worked out definite sales plans, rather than makeshift selling attempts, and these plans must have the stimulus of national background to supplement, but not be a substitute for, intensive aggressive local selling efforts carried on throughout the country by local representatives of all branches of the electrical industry. To accomplish this we must bring about, through cooperative teamwork between all branches of our industry, national and local surveys to ascertain useful and convincing information on which we can safely build future selling programs.

An agency available

The Society for Electrical Development was reorganized in 1927 for the avowed purpose of affording the four major national associations of the electrical industry and the electrical leagues full opportunity for sympathetic understanding of the many problems that seriously affect the proper development of the industry. The board of directors of the society is composed of the presidents, managing directors and other representatives of the four major national associations and the leagues of the electrical industry. This method of direct representation adequately provides an industry forum where full opportunity is given for frank discussion of problems that concern the entire industry. There is available a society staff which can function for the industry as a whole in carrying out any agreed national program, or, if desired, can actively participate in any joint industry movement sponsored by one or other of our national associations. The Society for Electrical Development has unquestionably proved itself an extremely valuable agency for harmony of action and the co-ordination of industry purposes. It is entitled to and must have joint industry support. Properly supported, financially and otherwise, it will further prove itself a helpful influence for good will between all elements of the industry and bring about better public acceptance of electric service and increased business for every branch of the industry.

Too much emphasis, it seems to me, has recently been put on the question of who shall and shall not share the fruits of commercial development of the electrical industry and on the extent to which each branch of our industry is entitled to the business, if at all. We are apparently losing sight of the fact that, while much has heretofore been accomplished—as is clearly evidenced by the aggregate use of electrical energy in this country compared with that of the rest of the world—the job of complete electrification of industry generally and of the homes of America, both city and rural, is only just begun.

Our market opportunities are vast and countless, provided we sufficiently realize there exists a mutuality of interest in the matter of development of the electrical industry in every essential particular, and provided we zealously guard its good name from unfair and unfounded attacks of the uninformed, who, without apparent regard for the economic or other consequences to our industry or the public generally, are perfectly willing to make us an object of attack in the halls of Congress, in our various state capitals and in municipal council chambers everywhere for the principal purpose, as they see it, of putting the federal, state and municipal governments into our business.

To overcome this communistic undertaking by all legitimate means is the common responsibility of every man and woman in the electrical industry, since certainly no one branch of our industry can be kept from normal growth without doing equal injury to all other branches. It is high time we think and act, through group teamwork, for our common good. By joint effort we can acquaint the public with facts and not fancies, and when

the public is correctly and fully informed we have nothing to fear. By group teamwork in thought and action we can continue to develop our industry splendidly to the satisfaction and profit of the public generally and ourselves.

If we decide to go it alone, each branch of the industry thinking and acting along lines calculated to advance its single purposes, the ever-increasing army of political wiseacres and their followers will find it extremely easy to excite the public to the belief that the present low ebb of business and all the ills that have resulted from almost two years of severe economic strain are the outgrowth of sinister schemes worked out under cover of darkness by the mythical "power trust" and its allies in the entire electrical industry.

After all, our principal duty is to afford the public, courteously and completely, the highest possible dependable service. Let us remember that the public everywhere is on edge, tired and worn from months of business uncertainty. If we think and act together, we can better discover in what respects our problems are alike and wherein they differ and thereby more sanely work out our many intricate problems, to the advantage of the millions of people who rightly look to us to develop still further the most splended industry known to man.

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Accidents and Economic Waste

By GEORGE N. TIDD
President American Gas & Electric Company

ACCIDENTS in the light and power industry result in annual direct loss of $7,500,000 and a total direct and indirect loss of $25,000,000 each year.

The contribution of the industry to national welfare is well known. It has made electric service available in ample quantity at a reasonable price; it has invested money in physical equipment to build a large mass of facilities upon which it pays taxes, and it employs about 300,000 men and women. It has applied the best ideas in management with respect to its business conduct and attitude toward employees, but there still remains a great economic loss resulting from preventable accidents. Each year 400 men lose a total of 250,000 workdays through accidents. The direct cost of these accidents is approximately $25 a year for each of the 300,000 employees and, if the twenty-life-year expectancy values are added, the gross annual loss becomes the staggering sum of $23,500,000.

Much has been done in accident prevention work—for example, fatalities were four times as numerous fifteen years ago—but, comparing individual companies with the average national records, it is very evident that much remains to be done. Accident prevention is an executive function, and safety must be added to efficiency and speed to get the desirable characteristics in the conduct of the business.

It has been found that a departmental organization with definite responsibilities is best adapted for the efficient conduct of business, and accident prevention must fit into this organization. Responsibility must be centered and not left to a committee. Each employee and each line executive must be responsible directly.

Some of the things a chief executive should do to promote accident prevention are:

1. An accurate accounting should be had of the cost resulting from accidents from the point of view of their elimination.
2. Line responsibility for accident prevention should be established from chief executive down through the line organization to foremen and employees.
3. Adequate measures for accident prevention should be used to develop employee morale and improve public relations.
4. A monthly report on accidents should be read with "follow-up" to show what improvement is being made in regard to accidents.
5. Proper maintenance and inspection schedules for all operations that may involve accidents should be instituted.
6. A code of operating rules should be established and enforced.
7. Accident-prevention consciousness should be developed in the organization through educational and promotional work.

The time has come when the human features of the industry must be considered in greater degree than ever before. Executives will do well to realize this and appreciate the fact that accident prevention is worthy of their efforts.

Residence Service Costs

A. C. Marshall

Allocation of investment and operating expenses shows value of greater use in lowering costs.
Detail basis of cost allocation.

By A. C. MARSHALL and HARRY A. SNOW

Vice-President and Assistant Controller, Respectively, Detroit Edison Company

IT IS proposed to describe the elements of a typical metropolitan central-station system, stating investment costs and the expenses of operation; to compute the cost per kilowatt-hour (1) at the power-plant switchboard, (2) at the substation switchboard, and (3) at the meter of a typical residence customer, and to compare these costs.

It is a common error, but an error just the same, to assume that the cost of supplying a unit of energy is reasonably constant, fluctuating only between rather narrow limits. The cost of a unit of energy is not a quality of the unit itself, it is a characteristic rather of the circumstances under which the unit is delivered.

To all investments directly allocated there will be added in this discussion 8 per cent to cover the investment in general offices, warehouses, shops, garages, laboratories, and communication systems and undistributed interest and taxes during construction. To all directly allocated operating expense items there will be added 13 per cent to cover the salaries of general officers and general office clerks, the operation and maintenance of general offices, printing and stationery, legal expense, injuries and damages, and relief and pensions. These added percentages are reasonable and proved by the experience of operating utilities.

As to annual fixed charges on plant investment, an acceptable total rate for the same must be adopted before undertaking the computation of costs. In order to get somewhere it is proposed to use in this paper a total of 14 per cent, considered as made up of 7 per cent for return on investment, 4½ per cent for depreciation and 2½ per cent for taxes. Other relative magnitudes pleasing to the reader may be substituted by him. Different situations require differing allowances for fixed charges. Certain properties have inherently low rates of depreciation; a very few are lightly burdened with taxes, and a utility of established credit may not need in order to obtain and hold the required capital as high a return as one whose standing has not yet been proved. The 14 per cent figure is chosen because experience shows it to be suitable in many representative cases.

In the system assumed for this study there are four power plants equipped with large steam-driven turbo-generator units constructed at a total cost of $100 per kilowatt of rated turbine capacity. The cost includes land, buildings, boilers, piping, turbines, generators, switchboards, step-up transformers, and, in addition, such machine shops, warehouses and offices as are directly connected with the power plants proper.

The four stations are connected with each other by interplant tie lines. Because of coal delivery and cooling-water requirements, all four plants cannot be located in the city itself. Two of them are at a little distance from the city which constitutes the center of load and deliver their output over 120,000-volt steel-tower transmission lines, feeding 120,000/24,000-volt step-down substations at the edge of the city itself. The interplant ties and the 120,000-volt transmission lines may be considered as part of the production system and the cost added to the bare cost of the generating stations, because the tie lines take the place of reserve capacity and the 120,000-volt transmission was necessary on account of the difficulty of locating the power plants closer to the city. Let us assume as the cost of interplant transmission $18 per kilowatt of rated generating capacity, giving a total direct cost of $118 per kilowatt of rated generating capacity, to which must be added 8 per cent for overhead investment, giving $127.44 per kilowatt of rated generated capacity.

It is assumed to be necessary to keep one turbine out of four in reserve in case of breakdown, so that the safe full load on the power plants is not more than 75 per cent of their rated generating capacity. The allowance for a spare turbine increases the investment per kilowatt of working load to $169.92.

Fourteen per cent for annual fixed charges on an investment of $169.92 per kilowatt of working load is $23.79 per year. At an anual load factor of 50 per cent.

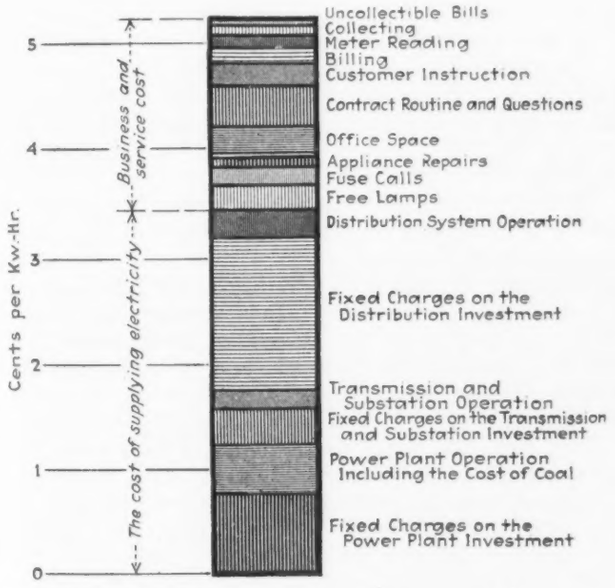
a kilowatt of load will produce 4,380 kw.-hr., and the fixed charges per kilowatt-hour are 0.54 cent. At 100 per cent load factor they are reduced to 0.27 cent per kilowatt-hour.

Coal costs, at 1.2 lb. of $3.50 coal per kilowatt-hour of net output, are 0.21 cent. Labor and maintenance expenses may be assumed at 0.14 cent per kilowatt-hour and general company overhead expense (13 per cent of other expenses, excluding fixed charges) will be 0.04 cent. The total operating cost per kilowatt-hour is 0.39 cent, and the grand total of all expenses at the power-plant switchboard, including fixed charges and overhead expense, is 0.93 cent per kilowatt-hour at 50 per cent load factor. For a 100 per cent load factor, if such a thing be possible, the expense is decreased to 0.66 cent per kilowatt-hour, because fixed charges are spread out over twice as many kilowatt-hours.

This is about two-thirds of a cent per unit of energy —the same unit of energy for which the householder pays 5 or 6 cents. The difference between 0.66 cent per kilowatt-hour and 6 cents per kilowatt-hour is not all profit to the utility; in fact, the reverse is apt to be true. There is a reasonable profit included in the price of 0.66 cent per kilowatt-hour. There are conditions under which energy sold at 6 cents per kilowatt-hour is not at all profitable to the utility.

Costs at the substation switchboard

In a metropolitan area such as is being considered the magnitude of the total load and the very small requirements of individual customers make it impossible to deliver energy directly from power plant to customer. For the large blocks of energy leaving the power plant a transmission system is required, as distinguished from the distribution system which handles the smaller units of load. Let us assume, for a metropolitan area, an average transmission distance of 4 miles from the power plant or step-down substation to the distribution substation, reached by 350,000-circ.mil underground cable operating at 24,000 volts.



Cost of residence service in a metropolitan area

550 kw.-hr. per year. 30 per cent load factor.

H. A. Snow

Such a cable costs $1.60 per foot installed, or $8,448 per mile. A twelve-duct conduit run constructed under a concrete pavement costs $8 per foot and, with a $450 manhole every 250 ft., $51,690 per mile. Not all of the ducts can be used. About half are reserved for future growth or are needed for ventilation, so that a twelve-duct run, on the average, will accommodate only six cables, giving an effective duct cost per foot of cable of $1.63 and per mile of cable $8,615. The combined cost of cable and ducts is $17,063 per mile, or $68,252 for 4 miles, to which must be added 8 per cent for overhead investment, giving $73,712 per cable.

A 350,000-circ.mil, 24,000-volt cable 4 miles long will carry 9,000 kva., but spare cables must be provided to insure continuity of service, and the load does not come in convenient units of 9,000 kv., so that in fitting the cables to the load there is a certain amount of waste capacity. For instance, to serve a small substation with a load of only 6,000 kva. in a rapidly growing district it is often advisable to install two 9,000-kva. cables, in spite of the fact that the two cables together could carry three times the maximum load. This is done to provide for growth and to take advantage of the economies resulting from the standardization of cable sizes.

Diversity also acts to increase the necessary number of cables. Consider the case of two substations each carrying a load of 18,000 kva. and each served by three cables, two working and one spare. One substation, in an industrial area, has a daytime load, and the other, in a residential area, has an evening load. Because of diversity the combined maximum load on the power station from the two substations together is only 24,000 kva., yet a total of six cables is necessary. Dividing the power-plant load by the number of cables gives only 4,000 kva. per cable. The case cited illustrates how diversity and the provision of spare cables may reduce average cable loading to low figures.

Let us assume that good engineering practice, taking account of spare cables, diversity and growth of the system, requires that the total power-plant load on 100 such cables shall be about 320,000 kw., or 3,200 kw. per cable. The cost of the cable and its ducts is $73,712. Dividing by 3,200 kw. gives an investment in transmis-

sion cables and ducts of $23 per kilowatt of power-plant load.

Underground transmission by cable and duct is expensive. Equivalent overhead capacity may be built for much less than the cost of underground construction. However, overhead construction can be used only in areas less congested than the streets of a great city, and the very absence of congestion that might permit the use of overhead lines would in itself defeat the purpose because the line would then perforce be much longer to reach the same total load. The congestion that forces underground construction also produces a partial remedy for high costs in the form of concentrated loads and relatively short lines.

At the end of the transmission line is a substation, housing transformers to reduce transmission voltage to primary distribution voltage, regulators to maintain an even voltage with changing loads, and oil switches to isolate trouble and permit the substitution of reserve equipment for equipment which has broken down.

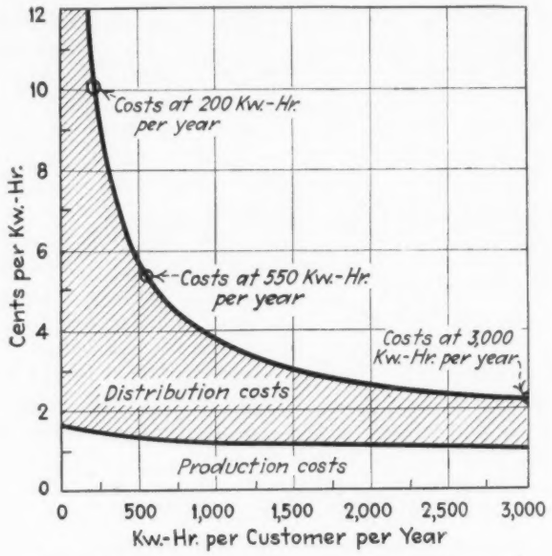
Substations vary widely in complexity and cost, from a simple outdoor-type transformer resting on a concrete mat, with overhead lines, to a five-story stone edifice, with underground cables, 24,000-volt oil switches, regulators, converting equipment for direct-current service, the essential transformers and an elaborate bus. The cost of the simplest type of substation is $7 per kva. of rated transformer capacity. The most expensive type of substation may cost as much as $50 or $60 per kva. or even more.

The type of substation selected for this discussion is a modern automatic substation which does not require attendants. It has two 6,000-kva. outdoor-type transformers, connected through disconnecting potheads to 24,000-volt underground cables. An automatic throwover on the 4,800-volt side isolates a damaged transformer in case of failure, transferring the load to the remaining transformer. From the 4,800-volt bus nine feeders carry the load to the feeding points of the distribution system. Each feeder is equipped with an automatic reclosing oil switch and a regulator. The transformers are out of doors. The 4,800-volt bus, switches and regulators are housed in a simple brick building. The total cost of the substation is $18.60 per kva. of transformer capacity, divided approximately as follows:

	Per Kva.
Land and improvements	$1.41
Building and outdoor mat	6.16
Transformers	2.46
Regulators	2.96
Other equipment	5.61
Total	$18.60

In the same way that the total rated carrying capacity of transmission cables exceeds the total power-plant peak, and for the same reasons, the total rated capacities of substation transformers must be much in excess of the power-plant peak. We will assume that it is necessary to provide 2.4 kva. of substation transformer capacity for each kilowatt of power-plant peak load. Using this ratio, the direct investment at the selected substation, which is $18.60 per kva. of transformer capacity, becomes $44.60 per kilowatt of power-plant peak. Adding 8 per cent for overhead investment gives $48.17 per kilowatt. The transmission cable investment is $23.00 per kilowatt of power-plant load. To this must be added $48.17 per kilowatt for the substation, giving a total of $71.17 per kilowatt of power-plant peak for transmission cable and substation.

The cost of operating and maintaining transmission lines and substations is not so important a factor as the fixed charges on the investment. The wages of substation operators, where required, and the maintenance of substations and cables are the largest items in an expenditure that is assumed as lying between 0.10 cent and



Cost of residence service at consumptions of 200, 550 and 3,000 kw.-hr. per year

0.15 cent per kilowatt-hour of power-plant output. We will use 0.15 cent per kilowatt-hour.

To the investment of $169.92 per kilowatt at the power plant has been added $71.17 per kilowatt for transmission cables and substation, and to the operating cost per kilowatt-hour at the power plant of 0.39 cent has been added 0.13 cent for transmission and substation expenses, producing the new totals of $241.09 per kilowatt and 0.52 cent per kilowatt-hour. At this point correction must be made for losses in transmission and for the time diversity between the several classes of load.

The electrical loss in transmission is taken at an average value of 6 per cent of power-plant output. Correcting to an efficiency of 94 per cent raises the investment per kilowatt of substation load to $256.30 and the operating expense per kilowatt-hour to 0.55 cent.

Diversity in time of occurrence between the peak loads of the several classes of service acts to reduce the necessary investment in power plant and, to a certain extent, in substations. It does not materially affect the operating expenses per kilowatt-hour. In a metropolitan system there may be as many as ten classes of service—residence lighting, short-hour commercial lighting, long-hour commercial lighting, low-voltage power, wholesale high-voltage power, street-railway power, street lighting, railroad power, etc. The ten classes of service have individual maximum loads, the simple addition of which will aggregate more than the peak load on the power plant. The reason is that the several class peaks are not coincident, but occur at different times of the day and year. The average class diversity, which is the ratio of the sum of the class demands to the system peak load, may be assumed as 1.4.

Class diversity is not a characteristic of a single class of service; it is a mutual relationship existing between two or more classes of service. There could be no class diversity in a system serving a single class of customers. Add a second class and the benefits of diversity come into existence. Who can say to which class the credit is due? Theories for dividing the benefits of diversity between the classes of service are as numerous and as bootless as the theories for the proper distribution of overhead expense. In this discussion each class of service is arbitrarily allotted an equal share in the savings arising from the time diversity existing between the maximum demands of all the classes. This is done by dividing the investment per kilowatt of substation load by the general system diversity factor of 1.4 and thus reducing it from $256.30 to $183.10 per kilowatt.

It is now possible to calculate the cost per kilowatt-hour of electrical energy at the substation bus. The only important variable is the load factor. At 40 per cent load factor the cost is 1.28 cents per kilowatt-hour, and at 100 per cent load factor it is reduced to 0.84 cent per kilowatt-hour by spreading the fixed charges on the investment over a greater number of kilowatt-hours. The average annual load factor for residence service is usually below 30 per cent, but may be assumed at that figure, and the corresponding cost of energy is 1.53 cents per kilowatt-hour at the substation bus. This figure includes fixed charges and operating expenses and is corrected for diversity and for electrical losses up to this point.

Costs at the residence customer's meter

Upon leaving the substation it becomes possible to select for study a distribution area that is almost purely residential in character and by so doing to avoid much theorizing as to diversity, peak responsibility, etc., and as to the dividing of investments and expenses between two or more classes of service. The area selected is one square mile of residence territory. Since all of the distribution equipment is used for service to one class of customers, the total investment may conveniently be used in place of unit investments.

In a residential distribution system the considerations of electrical engineering such as have governed costs from power plant to substation become less important. They are replaced to a large extent by considerations of mechanical strength and of distances to be covered. The fitting of the equipment to the load is largely supplanted by the fitting of equipment to the territory which must be served. Pounds and feet instead of amperes and volts become the controlling factors.

It follows that costs are out of proportion to the rather small quantities of current carried. Conversely, there are items of distribution equipment, notably poles and primary and secondary copper, which would not have to be increased to handle a large increase in load. An increasing load occasions some increase in the cost of line transformers and in service connections and meters, but not proportionately. The result is that light loads produce very high unit costs and additional loading brings relatively small increments in cost. The loading assumed herein is that resulting from a customer density of 2,240 per square mile, each customer requiring 550 kw.-hr. per year. The stated density is that actually found in a large city, and the consumption is the national average for all residence customers.

From the substation to the feeding point at the center of load of the premised square mile of residence territory there is required a 4,800-volt, three-phase feeder assumed to be 4,600 ft. long. For the first 2,300 ft. the feeder is a 450,000-circ.mil. underground cable, which with its ducts costs $7,430. This will serve two of the premised square miles. At a cable pole the feeder emerges from the ducts and divides into two overhead circuits of No. 0000 copper wire on 40-ft. wooden poles, each circuit adequate to service its square mile of territory. Each branch is 2,300 ft. long and costs $2,050. Adding to the cost of one overhead branch half of the cost of the 450,000-circ.mil cable gives $5,765 as the total cost of the feeder for a square mile of territory.

The backbone of the distribution system is a network of three-phase No. 2 primary ring mains, 6.15 miles in total length, which is tapped at intervals by single-phase No. 6 primaries, aggregating 7.1 miles in length, leading to the line transformers, which are mostly 10 kva., and which sum up to 1,130 kva. The secondaries are No. 2 copper, 18.1 miles total length, single-phase, 230-115 volts. Supporting the wires there are 1,015 40-ft. Western cedar poles and 60 25-ft. stubs. The 40-ft. pole is of the minimum height permitted by city regulations.

It is recognized that there are many types of primary and secondary distribution for residence service, but the difference in final costs between the several systems seems to be insufficient to change conclusions.

In the square mile there are 4,381 lots, 35 ft. or 40 ft. wide and about 120 ft. deep. Forty-six per cent (2,015) of the lots (an average for the city of Detroit) are occupied by houses, so that there are 2,015 service connections, of which 806 have two No. 8 wires, 1,008 three No. 8 wires and 201 three No. 6 wires. There are 2,240 customers who are equipped with 860 5-amp., two-wire meters, 1,065 10-amp., three-wire meters and 215 25-amp., three-wire meters. In certain cases one service connection serves more than one customer.

The total cost of the distribution system in the square mile is as follows:

Feeder	$5,765.00
Poles and fixtures	34,702.52
Primaries and secondaries, including guying and tree trimming	29,207.91
Line transformers and installations	17,293.74
Services	9,371.74
Meters	21,897.00
Total	$118,237.91
Add 8 per cent overhead investment	9,462.09
Total	$127,700.00

Fourteen per cent annual fixed charges on $127,700 are $17,878. The total annual consumption of 2,240 customers, each using 550 kw.-hr. per year, is 1,232,000 kw.-hr., and dividing this into the annual fixed charges of $17,878 gives 1.45 cents per kilowatt-hour the fixed charges per kilowatt-hour on the distribution investment. Note that the fixed charges per kilowatt-hour on the distribution investment (1.45 cents) are nearly as great as the total cost of energy per kilowatt-hour as it leaves the substation bus (1.53 cents).

Operating and maintenance expenses on the distribution system from substation bus to the customer's meter are not so large as the fixed charges. They may be estimated at about 0.26 cent per kilowatt-hour. This is a conservative figure, as indicated by the fact that it is equivalent to but 2.5 per cent on the investment. Adding

13 per cent for overhead operating expense brings this item to 0.29 cent per kilowatt-hour.

The largest single item in the cost of operating and maintaining a distribution system is the maintenance of lines. A measurable element of this expense is occasioned by the necessity for moving poles out of the way for street widening and paving projects, or to suit the convenience of property owners who have garages opening on alleys, etc. Another element in line maintenance costs is the repair of damage done by storms. The next largest item is the cost of the continual setting and removing of meters and line transformers as load conditions change and customers move from old houses to new and from one place to another. The testing of meters is required periodically by regulatory commissions. If it costs $1 to make a test once in five years, the cost per kilowatt-hour for this item alone is 0.04 cent. The cost of trimming trees to keep branches away from the lines is increasing from year to year because city foresters are requiring that the trimming be less drastic; hence it must be minimized on each occasion and repeated at more frequent intervals to keep ahead of the natural growth of the trees.

It is recalled that the cost of energy at the substation bus at a 30 per cent annual load factor was 1.53 cents per kilowatt-hour. The electrical losses in the distribution system from the substation to the customer's meter are assumed as 10.7 per cent of power-plant output, divided as follows:

	Per Cent
Feeder and primaries	0.1
Line transformers:	
Copper loss	1.3
Core loss	3.8
Secondaries	3.7
Meters	1.8
Total loss	10.7

Correcting for this further loss of 10.7 per cent of output increases the cost of energy at the substation switchboard (1.53 cents) to 1.73 cents per kilowatt-hour. Adding 1.45 cents for fixed charges in the distribution investment and 0.29 cent for the operation and maintenance of the distribution system gives a total cost at the customer's meter of 3.47 cents per kilowatt-hour for the electrical energy delivered and used.

Utilization, commercial and new-business costs

We have now itemized and evaluated the elements of cost involved in generating the energy and moving it from the power house to the customer's meter, but these items do not constitute a complete statement of cost. There remain the costs of reading meters, preparing bills, collecting and recording payments, writing off the uncollectible accounts, receiving the customer's order for service and canceling it when the service is terminated, instructing customers in the use of service, answering questions, renewing burned-out fuses, supplying incandescent lamps and inspecting and repairing appliances.

The electric utility in many instances supplies lamps to its customers without separate charge, the rate for service covering the cost of the lamps. The utility, buying in quantity, can purchase lamps more cheaply than can its customers as individuals, and it does not indulge in the expensive luxuries of cheap and inefficient and short-lived lamps. If the utility undertakes to renew without charge the lamps burned out in service, it may expect to furnish the equivalent of ten 40-watt or 50-watt tungsten lamps to each residence customer in a year's time. The cost of a free lamp service, with an allowance for overhead expense, will then be about 0.24 cent per kilowatt-hour sold.

It is inevitable that the customer's service will be interrupted occasionally by blown fuses or other minor troubles. The customer might be left to struggle with his own darkness, but he much prefers the privilege of calling on the utility. A trip to replace fuses costs about 80 cents, and an experienced average of a little more than one call a year per customer means a cost per kilowatt-hour sold of 0.16 cent.

Free renewals of worn-out cords for electric flatirons and minor repairs and adjustments of electric appliances are most welcome to the customer and are best done by the utility, with the cost included in the rate for electric service. The tested expenditure of 60 cents per year for each customer is a very wise addition to the cost of service and is equivalent to only 0.11 cent per kilowatt-hour sold. Even at this low figure the labor of keeping appliances in order is more than the labor for the operation of the power houses that generate the current.

Two other less important items of customer service are interesting because of their nature. A continual checking of voltage to assure good service, supplemented by the following up of "poor light" complaints received from customers, and the investigation of complaints of interference with radio reception are found to amount to 0.03 cent per kilowatt-hour sold.

These utilization expenses for free lamps, fuse calls, appliance repairs, voltage and radio complaints total 0.54 cent per kilowatt-hour sold. Note that these expenses (with the partial exception of lamps) do not vary proportionately to the number of kilowatt-hours consumed. In fact, they are more nearly independent of consumption than proportional to it. The kilowatt-hour is in this particular only a convenient means of computing a unit cost. As to lamps, if all energy sold were used in lamps, the stated figure would be somewhat increased.

The necessity for transacting business with a great number of small customers occasions some investment of capital and a large item of operating expense. A certain utility serving 23 cities and 64 villages in contiguity to one another has 477,870 residence customers. To maintain business relations with them the utility has 66 commercial branch offices. The investment in office buildings and equipment used in this work is $3,226,000. Fourteen per cent annual charges on this investment, plus the rental of some of the offices that are leased instead of owned, plus the wages of janitors and watchmen, and plus maintenance costs, total $765,400 annually. This is $1.35 annually per customer, and for the residence customer consuming 550 kw.-hr. annually it is 0.25 cent per kilowatt-hour solely for the provision of office space.

An extensive staff of clerks is needed to transact the business, to take orders for service and for the discontinuance of service, answer questions, accept payments on bills, renew burned-out lamps and investigate and adjust complaints. In one year 3,820,000 commercial transactions with customers were handled by the large utility used as an example, and this figure does not include the testing, setting or reading of meters, the delivery of bills, trouble calls or the collection of overdue accounts. The total cost of operating the commercial offices was a little

more than $1,000,000, or $1.91 per year per customer. For a residence customer using only 550 kw.-hr. per year this cost is 0.35 cent per kilowatt-hour. The cost of answering a residence customer's questions is more than the cost of coal to generate his energy.

No matter how small a customer may be, the utility must keep a separate ledger account of his debits and credits. For a utility having hundreds of thousands of customers the billing office will issue millions of bills each year. It will have literally hundreds of customers' ledgers and scores of clerks engaged in posting and balancing them. The bimonthly billing (in place of monthly billing) of residence customers where adopted has effected a saving in these costs, and machine billing has made it possible to turn out bills by the million, but it still costs 16 cents a bill, or 96 cents a year, to bill the residence customer. This is 0.17 cent per kilowatt-hour.

The cost of reading meters has been reduced to 8 cents per meter reading, or 48 cents per annum, which is 0.09 cents per kilowatt-hour sold.

The reading of the meter and the preparation of the customer's bill do not complete the job. Even a liberal discount for prompt payment does not insure the payment of all bills. The collection staff must mop up the slow accounts, and eventually it is necessary to give up hope of collecting the dregs of the billing, which may amount to about 1 per cent. A reasonable allowance for collection expense is 10 cents per kilowatt-hour, and for uncollectible bills it is 0.06 cent per kilowatt-hour sold.

The last item of expense is that for the development of new business. Advertising is used to a certain extent to keep customers informed of advances in the art and of new services available, but a greater expenditure is incurred in teaching methods of using the service so as to obtain the best results from it. The utility often bears a part of the expense of installing equipment in the customer's home. The result is of material benefit to the customer and to the utility, and a reasonable expenditure of perhaps 24 cents per kilowatt-hour sold is amply justified.

This completes the listing and evaluation of expense items. The summary is contained in the accompanying table.

It must be recognized that many of the costs and ratios that have been used to build up this synthesis of the cost of residence service are taken from the records of one utility operating in a large city, but these have been supplemented or confirmed by data from more general sources wherever possible. It must also be admitted that they may not be entirely applicable under the difficult conditions presented by a sparsely settled area with widely scattered customers, nor by a poverty-stricken community in which the customers cannot afford the service they need, nor by a mountainous country with pole settings blasted out of the solid rock, nor by a non-industrial territory with its vicious lighting peaks, nor by unreliable and expensive water powers subject to droughts, nor by expensive coal, nor by a score of other situations that fundamentally affect the cost of service. This statement of costs must be accepted for what it is, as applying to residence service in a prosperous, industrial community favorably located and rapidly growing.

We have seen that the cost to supply energy to a high load-factor customer at the power-plant switchboard may be as low as 0.66 cent per kilowatt-hour, and we have computed the cost to a large industrial customer taking energy at primary voltage over a short line from the substation, and having a load factor of 40 per cent, as 1.28 cents per kilowatt-hour. And yet the cost of a small quantity of energy to a residence customer is 5.28 cents per kilowatt-hour, or four times as much as the cost of factory energy and nine times the cost of high-load-factor energy at the power plant. The energy itself, except perhaps for voltage, is identical at the three places. A kilowatt-hour will heat equal quantities of water or provide equal quantities of mechanical energy through a motor, or of light in a lamp, wherever it may be; but the cost of generating and delivering it may range, under varying circumstances commonly met with, from 0.66 cent to 5.28 cents or higher, all of these costs being predicated on the assumption of the same rate of return to the utility upon its used and useful investment.

The foregoing computation of costs is equally fair to all classes of service. Note that the rate of return, 7 per cent on the invested capital, is uniform throughout the discussion, so that the high cost of service to the small customer does not result from the assessment of a disproportionately high return on the investment to serve him. Overhead expenses and investments are spread evenly over all items, and the advantages of diversity are given equally to all classes of service. The residence service is not discriminated against at any point in this synthesis of costs; and yet the computed cost of a kilowatt-hour for residence service under these premises is about nine times as large as the cost of an identical kilowatt-hour taken at the power plant bus at 100 per cent load factor.

Costs Summarized and Compared

(At customer's meter, 30 per cent load factor, 550 kw.-hr. per year)

	Cents per Kw.-Hr.
Power-plant investment	
$100 per kw. of rated generating capacity; add interplant ties and 120-kv. transmissions; add overhead investment; correct for 25 per cent reserve capacity, 1.4 general system diversity and 16.7 per cent loss..	0.78
Power-plant operation	
1.2 lb. of $3.50 coal per kw.-hr. of net output; labor, maintenance and overhead amount to 0.16 cent per kw.-hr. of net output; correct for 16.7 per cent loss	0.47
Transmission and substation investment	
Four miles of 24,000-volt, 350,000-circ.mil cable (and ducts) carrying 3,200 kw. per cable; semi-outdoor automatic substation at $18.60 per kva. of transformer capacity; 2.4 kva. per kw. of power-plant peak; add overhead investment; correct for 1.4 general system diversity and 16.7 per cent loss.....	0.33
Transmission and substation operation	
0.13 cent per kw.-hr. of power-plant output; correct for 16.7 per cent loss.....	0.16
Distribution system investment	
A square mile of residence territory; one feeder, 4,600 ft. long, partly underground, 1,015 poles, 32.65 miles of primary wire and ring mains, 1,130 kva. of line transformers, 54.3 miles of secondary wire, 2,015 service connections and 2,240 meters; costing, with overhead investment, $127,700.....	1.45
Distribution system operation	
Maintaining lines, moving lines, testing meters, setting and removing meters and transformers; 2.5 per cent of distribution investment.....	0.29
Utilization expenses	
Ten 40-watt lamps per year per customer.....	0.24
One fuse call per year per customer.....	0.16
Appliance repairs	0.11
Radio interference and voltage tests.....	0.03
Commercial expense	
Office space	0.25
Contract routine and questions.....	0.35
Billing—six bills per year.....	0.17
Reading meters six times per year.....	0.09
Collection expense	0.10
Uncollectible bills—1 per cent of billing.....	0.06
New-business expense	
Instructions in the use of appliances, installation costs, advertising, etc.	0.24
Total cost per kw.-hr. sold for 550 kw.-hr. per year at 30 per cent annual load factor.....	5.28

Booths more inviting.
Varying degrees of dramatization.

Exhibits Feature

EMPHASIS upon the opportunities to increase domestic usage of electric service, and consequently revenue, was the dominating characteristic of the exhibits this year, if one may trust to general impressions. This concentration on domestic load building was quite logical, in view of the necessity for developing new business; but the doubt arises whether some manufacturers did not lose an opportunity to build business for the future by not giving equal weight to commercial and industrial developments, particularly applications of electric heat for heat treating, melting, enameling, and so forth.

Domestic Uses

Engineering developments must be studied to realize significance.

Business machines and methods to facilitate the mechanization of accounting, billing, etc., were prominent, suggesting the question whether the economies in overhead expense made possible by such devices are as extensively applied as they might be.

Engineering displays, while they collectively involved numerous kinds of devices, left the impression that they had been subordinated, but the smaller opportunity afforded by these displays for dramatization may account for this feeling.

There was a marked tendency this year to make booths more inviting. Attractive decorations, fountains, shrub-

bery, flowers, use of light to focus attention and more extensive lounging facilities arrested attention and invited footsore visitors to stop, rest and converse a while.

Dramatization of displays was most prominent in booths exhibiting household devices. But some exhibitors of technical products accomplished excellent results through singling out their most recent developments and making them as well as other exhibits self-explanatory, by means of prominently labeled cut-away sections, exposed mechanisms, large-scale diagrams showing positions of applications, large installation pictures and detailed drawings with data and demonstration equipment. As much cannot be said for other booths where a visitor could find out what was new only by consulting an attendant. Frequently these attendants were busy talking with some group, so the visitors passed on without inquiry. Labeling articles, with a printed explanation of their significance, would have added much to the attraction of such booths.

Two extremes were observed: There were exhibits which embodied chiefly new or greatly improved devices; there were others which contained such a variety of devices that a visitor without a personal escort left with only the impression that diverse products were shown but with no specific ideas of applications. Again, the labeling of features would have greatly aided the overburdened attendants or drawn visitors to displays the significance of which was not readily apparent.

Among the household-device displays, ranges, water heaters, washers, ironers and refrigerators were so prominent that no one could leave the convention without vividly recalling these opportunities for domestic load building. Other household devices too numerous to mention greeted the eye on every hand. In these displays were occasional suggestions for the use of commercial cooking and baking, commercial refrigeration and water cooling. Apparatus for cooling the air and for heating rooms was evident to the close observers.

Some dramatically displayed applications of lighting equipment suggested various ways in which new or improved light sources or new or improved ways of combining standard products could be used to produce both esthetic and utilitarian effects indoors and outdoors. New gaseous-tube lamps, producing various colors, and equipment for beautifying shrubbery and foliage at night were instances in point.

Engineering displays were both mechanical and electrical, with the latter predominating. So far as number of exhibitors was concerned, the displays ranked in about the following order: Line materials, insulators, wire and cable, lamps and lighting equipment, meters, relays and instruments, high-tension equipment, circuit breakers and switches. Mechanical displays featured meters and control, combustion equipment, preheaters and superheaters, and valves, fittings and tubes made of various metals. But again the methods of display subordinated the importance of some exhibits and elevated others to a prominence not evident from an analysis of the exhibition directory.

Where a questioning attitude supplemented the lure of dramatized exhibits, products and applications of interest which might otherwise have been overlooked were revealed. Even then a visitor was likely to leave with new ideas almost sure to become "scrambled" unless he took notes and arranged to have literature forwarded to him.

The displays of the national sections of the N.E.L.A. on each side of the stage merited study.

▼ ▼ ▼

Prize Winners of the Public Speaking Contest

First Prizes: Claude E. Miller and Lucille Harris, Wichita Gas & Electric Company, Wichita, Kan.

Second Prizes: Thomas F. Roach, Southern Colorado Power Company, Pueblo, Colo., and Alice Marshall Adams, Philadelphia Electric Company.

Third Prizes: Paul F. Fitzsimmons, Cambridge (Mass.) Electric Light Company, and Mrs. Lillian Broeker, Pacific Gas & Electric Company.

Back Row (left to right)—Paul F. Fitzsimmons, W. S. Vivian, chairman speakers' committee; Thomas F. Roach, Claude E. Miller.

Sitting—Mrs. Lillian Broeker, Alice Marshall Adams, Lucille Harris.

GHOSTS

Indefinite generalities charged against the power industry by irresponsible people.
The charges and the answers outlined.

By EDWIN GRUHL
Vice-President North American Company

ONE of the difficulties confronting the electric light and power industry at the present time is that the criticism to which it is being subjected comes mainly from irresponsible sources. I do not mean by this that men in high public office, such as members of the Senate and the House and the governors of several of our states, are to be accused of deliberate misstatements. Though men in public office have the means, they do not always have the time personally to acquaint themselves with the facts on the many important public problems with which they must deal. As a result, it is well known that the public writings and utterances of many of them are prepared by others in whom they presumably have confidence. So widespread has this practice become that the unidentified author has come to be known, in newspaper parlance, as the "ghost." We must be charitable, therefore, if on public subjects some of the orators of the political industry often seem to be "talking through their hats." They have merely been ill-advised and misinformed by their "ghosts."

In the many shades of political thought which comprise our public opinion there are those who sincerely believe in a paternalistic government—that the idea of private profit is not compatible with public service, and that such communal action is necessary to avoid a great disparity of wealth, income and opportunity. The economic, as well as political, monopoly of the state is a consummation so ardently to be desired, these thinkers believe, that they hold it is justifiable if, in the furtherance of the cause of so-called "social justice," unreliable information and even actual misstatements are employed. They consider that they are fighting an unprincipled and unscrupulous adversary fully capable of taking care of itself. The end justifies the means, in their opinion, and high idealism readily stoops to conquer by dishonesty.

They have selected the electric light and power industry for government ownership as an entering wedge, for they would nationalize all industries. One of their orators at a recent council of war said: "We have come, so far as I am able to know, almost to universal monopoly in all goods that enter the world markets. We talk about public utilities, the power trust—there is no distinction between the power trust and the oil trust and the banking trust and a multitude of other trusts, and they all act together."

What are these misstatements and distortions of fact regarding the electric light and power industry? All of them, our opponents say, are based upon evidence gathered in the Federal Trade Commission's investigation. The present investigation is now in its fourth year, and its reports and exhibits to date for the partly completed job comprise 32 volumes of more than 14,000 printed pages—already a rather large job of reading for the most studious statesman or the most industrious "ghost."

As an illustration of what fancy rhetoric and fanciful imagination has done, I am going to enumerate a dozen of the more important misstatements, quoted in the words of political orators and their "ghosts," together with some comment by way of correction.

"Ghost" charge No. 1 is as follows:

> Recent investigation by the Federal Trade Commission has shown that those who, in the main, control the supply of electricity have organized themselves into the most gigantic, far-reaching and comprehensive monopoly which has ever been devised by the mind of man.

The fact is well known that the Federal Trade Commission in its investigation of corporate holdings in 1927, made under the Senate resolution introduced by Senator Norris, found that no "power trust" existed. The evidence reported by the same commission in its present investigation, under the Senate resolution introduced by Senator Walsh of Montana, has so far not disclosed any changes in fact which should alter its previous conclusion. If this "ghost" charge is true, it is the duty of the Federal Trade Commission so to report and of the appropriate department of the government to restrain this imagined gigantic monopoly.

"Ghost" charge No. 2:

> This gigantic trust has secretly enmeshed its slimy fingers in the warp and woof of human life.

Those who make such a grotesque, vague charge can point to no American business whose activities have been so fully and constantly illuminated as those of public utility corporations. Their regulation is bottomed upon

the idea of complete publicity. Not only are their corporate acts matters of public scrutiny, but the accounts of operating companies must conform to practices prescribed by the state regulatory authorities and are subject to audit and approval by these same authorities. In many states the records have been an open book for more than twenty years. It is inconceivable how, under the watchful eye of the regulatory authority and the vigilance of inquiring and sometimes hostile newspapers, any of the operations of any public utility company could be long conducted in secret, even should it desire so to conduct them.

"Ghost" charge No. 3:

How heavily every home is being drained! . . . It makes its unholy levy upon all classes of people—the student, poring over his lessons, contributes his share; the washerwoman, supporting her fatherless children, cannot escape the financial exactions of the power trust.

The fact remains uncontroverted that electric service is the only item in the household budget that has decreased continuously since 1914—that it represents only one cent out of each dollar of the average family's expenses. Of course, the "ghosts" of government ownership oratory cautiously sidestep the fact that the average cost of government per family, which in 1913 was six times the average family electric bill, has increased to fifteen times the average family electric bill of $31. The cost of government is fifteen times as exorbitant—and here I employ the word literally—as the cost of electricity in the household. The cost of electricity used in manufacturing, according to the latest reports of the United States Census Bureau, continues to average less than 3 per cent of the cost of manufacture.

"Ghost" charge No. 4:

The secret agents of this trust have gone into political partnership with the lower elements of humanity and have undertaken to and in many cases have succeeded in corrupting public officials. . . . . They own and operate the party machinery.

This is important, if true. Such practices, if they exist, are felonies in every state in the Union. The investigations of the Federal Trade Commission do not disclose a single instance of such corruption. It is significant that "corrupting public officials" is the prescribed item in the cause for action in the briefs in debate for public ownership. It is a charge that sounds important in print or in oratory.

"Ghost" charge No. 5:

The evidence shows that they have continuously and unremittingly watered the stock of their numerous corporations, paying no attention whatever to their investments, but charging rates based upon false capitalizations and corrupt methods of accounting. . . . These interests work together harmoniously under a common policy and toward a common end, which is milking the public—the most gigantic graft ever imposed or collected by any single business since the world began.

If these charges were true, it would certainly be the privilege of any complaining group of citizens, the duty of any regulatory authority, spurred on by a militant press, to remedy any public injury which might be occasioned by such practices, if they existed. The commissions and the courts have uniformly held that the capitalization—the stocks and bonds—of a public utility has no relation to what shall be allowed for fair return. They have said that cases may be conceived in which stock and bond history may have evidential value, but its bearing on rates and return at best is remote. Recently the Federal Trade Commission completed three years of investigation of the companies I represent, covering the period since their organization, in some instances as early as 1881. The detailed testimony, exhibits and reports of the commission's examiners, covering thousands of pages, furnish proof that in respect to these companies every single assertion in the charge I have quoted is unqualifiedly false.

"Ghost" charge No. 6:

The industry has attempted to control public sentiment by the purchase, directly or indirectly, of newspapers.

This is an attack on the integrity of the American press. There are nearly 2,000 daily and about 20,000 weekly newspapers in the United States. Even an obtuse person would not seriously expect to be able to control enough of them to exert any appreciable influence, and no sane person would attempt it. The identity of ownership of a newspaper cannot long be concealed. There would inevitably be a blacklist, and the utility-owned newspaper would soon be thoroughly impotent. The Federal Trade Commission has disclosed no instance of a utility company owning a newspaper either directly or indirectly. A paper-manufacturing company affiliated with a power company purchased stocks in several newspapers as a part of its activities in the sale of newsprint, and the evidence was that during the brief period intervening before it disposed of its holdings there was no attempt on the part of the paper company and its affiliated power company to influence the editorial opinion of the newspapers concerned. Even if there had been such an ill-advised effort, it would and certainly should have been abortive.

"Ghost" charge No. 7:

The industry has subsidized colleges and college professors.

This is a blanket indictment against the colleges. A minute examination of the records of the Federal Trade Commission's searching investigation shows references to 217 colleges and universities and 501 professors. Much of the testimony relates to scientific or technical questions arising from the fact that many young men aspire to become electrical engineers and, naturally, colleges and universities teach electrical engineering.

If there is anything improper in this, it is the charge in itself. The relationships between the utilities and the colleges were only such as necessarily must exist in our present-day civilization, which must give full recognition to the industrial conditions. The college which shuts the door on the admission of modern-day facts which involve the entire population can only take its place at the rear of the line.

The contacts between the utilities and the colleges have been open and in the majority of instances have been at the request of the colleges. It is inconceivable that testimony should be so distorted and stretched by "ghosts" as to endeavor to make the public believe in a corrupt relationship between colleges and utilities. Mere recital of the names of the many presidents, deans and other well-known professors appearing in the testimony should be sufficient denial of such a picture.

In some instances research work has been done by college professors for utility companies, as such work has also been done by college professors for other industries. From a careful review of all the evidence, it is impossible to construe the relationship as improper, and there is recorded not a single instance of improper action by college authorities because of such relationship.

"Ghost" charge No. 8:

They have poisoned the wells of public education through propaganda directed against public ownership.

The Federal Trade Commission record on this point is voluminous. It covers the activities of 38 bureaus of public information. In every instance the pamphlets distributed showed their source and were distributed at the request of school authorities. Only one pamphlet had a direct reference to public ownership. According to the evidence before the Federal Trade Commission, these pamphlets had the approval and sanction of more than 7,900 educators, including state and city superintendents of education and principals and teachers of schools throughout the country.

"Ghost" charge No. 9:

The industry has indulged in expensive advertising of no immediate or intrinsic value to its business in order to influence subtly the general attitude of the public and the opinions of editors; it has contaminated and misled the press.

The Federal Trade Commission's investigation shows that the electric light and power companies of the United States spent approximately $13,000,000 in 1928 for all types of advertising. Of this amount about $8,500,000 was spent for advertising space in 14,476 daily and weekly newspapers. Forty-three per cent of such advertising related to appliances, 10 per cent to new business, 10 per cent to advertising securities; the remaining 37 per cent might be classed as institutional or good-will advertising. The truth is that newspapers criticise the utilities for spending too little rather than too much for advertising. We are told that 33 automobile companies spent nearly $53,000,000 for newspaper advertising in the same year; 17 tobacco companies spent more than $16,000,000; 33 toilet-goods companies spent over $12,000,000.

Edwin S. Friendly, business manager of the New York *Sun*, said at the annual convention of the Public Utilities Advertising Association in Washington in May, 1930: "If I were asked for advice, I should say to the public utilities: Instead of spending two-thirds of 1 per cent of the industry's gross income for advertising, the public utilities should increase this very small amount, and they might find an excellent example in the New York department stores, which are among the best managed in the country. The average department store appropriates about 4 per cent of gross income for advertising."

As to the charge that the utilities advertise for the purpose of influencing editorial opinion, I think that the newspaper editors themselves can be depended upon to defend their own integrity. Any editorial opinion that could be bought by advertising wouldn't be worth the investment.

"Ghost" charge No. 10:

The industry has secretly and by unfair and dishonest means attempted to build up public sentiment.

This charge is sometimes elaborated to include women's clubs, boy scouts' clubs and farmers' organizations. None of these efforts, upon careful examination, can be construed as otherwise than legitimate promotion of the uses of electricity. For example, boy scouts were utilized to distribute bulletins, as they do others, for the postage, half of the money so earned going to the Boy Scout endowment fund and half to the purchase of scouting equipment. The relations with farmers' organizations were solely for the purpose of increasing electrification of the farms and improving the service rendered by the industry to agriculture. Similarly, the relations with women's clubs were entirely designed to spread general knowledge of the invaluable advantages of electricity in the home.

These activities were not secret; they were neither dishonest nor illegitimate. Wherever there was an effort to build up sentiment in favor of the electric light and power industry it was a defensive effort—a defense against our traducers. It was resistance to a muzzle. A mass of evidence was offered to the Federal Trade Commission showing that the attack came, as it still comes, from such propagandists for government ownership as the League for Industrial Democracy, the Public Ownership League of America, the National Popular Government League, the People's Legislative Service and others. The electric light and power industry did not seek this fight. It did not attack. But it had the right to fight in defense of its honest methods and objectives.

"Ghost" charge No. 11:

There has been published and distributed printed matter, much of which is disguised to have the appearance of impartial research studies. . . . Emissaries have been sent to Canada to bring back misleading and untrue reports on municipal ownership.

There are two general charges here. The first doubtless refers to an article by Dr. S. S. Wyer which disclosed that the majority of the provincial debt of Ontario is for money advanced to its governmental hydro system and asserted that the electric system is selling service "not at cost" but "at cost of the public." The second refers to a pamphlet prepared by Professor Stewart of the agricultural engineering department of the University of Minnesota on the Ontario system, which he investigated as a paid agent of the Minnesota Committee on the Relation of Electricity to Agriculture. It is creditable and not reprehensible that some one should have sought an impartial report on a situation concerning which there have been so many misleading statements circulated by propagandists in favor of government ownership.

"Ghost" charge No. 12:

Regulation has proved a failure because in too many cases the regulators are regulated by this monopolistic trust.

This is another blanket accusation, without specific application, without any supporting evidence either general or specific, and without confirmation by the investigators of the Federal Trade Commission. Incidentally, it is one of the principal points prescribed in the old debating book as the affirmative cause for action in the brief for public ownership. But even in a debate the point lacks power when it lacks proof.

Donald Richberg, well known for his radical utterances, his sponsorship of government ownership and his work in many political campaigns, has made this honest restatement of this point: "To my mind the greatest difficulty with the private regulation of public utility corporations in this country has been the blindness of the average citizen to the fundamental fact that the furnishing of public utility service is a public business and that the making of private fortunes out of public business through any device whatsoever is a breach of public trust and the betrayal of a sacred obligation. Those who advocate public ownership and operation of public service enterprises are in effect contending that public obligations cannot be imposed and enforced except in this manner.

They are, of course, seeking to remove the incentive of private gain from the control of public service."

That is, at least, a candid admission. It is a clear and concise statement of the philosophy of those politicians and social reformers—and their "ghosts"—who promote the unceasing propaganda in favor of government ownership of business. It boils down into a few words the reason why they are at war against the electric light and power industry, the utilities as a whole and private business in general: They believe *there should be no profit;* that profit is sinful and labor is not worthy of its hire; that the state should be an economic as well as a political monopoly; that government will provide, no matter how much it costs, and that we must eventually—and why not now?—lapse into the Nirvana of communism.

That is why there are so many "ghosts" haunting the electric light and power industry—why their emanations are shadowy, unreal, without substance. Like any enterprising medium, they keep "tilting the table." Some one has said that all industry is confronted with a ghost, the ghost of Karl Marx—or is it, perhaps, Lenin?

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Volume and Density in Domestic Sales

By SAMUEL FERGUSON
President Hartford Electric Light Company, Hartford, Conn.

EIGHT years ago I had the pleasure of addressing the Commercial Section of the New England Division on the subject of promoting the residence load. The burden of my remarks was to the effect that full use of household appliances was not to be expected when they had to be used on the then generally existing straight-line lighting rates, nor would customers generally go to the expense of a separate circuit to obtain the lower power rate, and that on account of this poor prospect for business I had never been really enthusiastic about merchandise sales. I pointed out, however, that the use of a promotional rate entirely changed the whole situation as it gave a power price at every socket in every customer's house without the need of expensive wiring, and that on this account I had completely reversed my attitude relative to the benefit of merchandise sales, since no longer, in order to induce the housewife to use the electric iron for the family wash, did our salesmen have to sell with each electric iron a wiring job costing many times the price of the iron. My advice to that gathering was to first sell to their executives the idea of the promotional rate, because with that accomplished the interest and support of the executives would follow automatically.

Since that time promotional rates have been widely adopted, and a very rapidly rising energy use per customer is the result; or, rather, it has resulted from the promotional rate developed only part way to its logical conclusion—and I do not believe there exists any longer the complaint of luke-warm executive interest in miscellaneous home uses in addition to lighting.

I class any rate as promotional which retains the revenue now received for present usage but at the same time offers a lower price to each and every customer for the hoped-for but as yet non-existent new business. In practice this usually means a two-part rate having a low energy charge—how low the energy charge should be depends entirely on what you are trying to promote. The earlier rates looked only to promote additional lighting and miscellaneous household uses and were not carried to the logical final low figure by which the heavy-duty usage can be promoted if such business is worth going after.

Good business waiting

What I wish to emphasize today is the fact that you have not yet sold to the executives of our companies the realization of how good a business is waiting in the heavy-duty household usage and how far we are justified in going in the matter of expense and rates to obtain its benefit. The possibilities of this splendid field must be demonstrated before you will be given the full executive backing which is essential to progress.

The fact is not yet realized that the domestic business, instead of having the poorest load factor of any class, is capable of being developed to be the very best, excepting only street lighting and the occasional twenty-four-hour industrialists. The problem of the commercial men of the industry is how best to demonstrate this to their own particular executive heads in a convincing manner. In other words, you must convert an intangible and interesting but theoretical thing called "diversity" into a real picture of dollars and cents. When this is accomplished their attitude will change from the present passive indorsement of your activities to one of active co-operation.

One last word of advice as to executive mentality. Data collected from your own system will be infinitely more convincing than data from elsewhere, so my recommendation would be to go out and obtain data from a group of heavy-usage customers, even if you have to equip the houses at your own expense. In this line, as in many others, seeing is believing, and when the other fellow's data are used there are too many ways in which figures may be made to lie for his figures to have the same weight as your own, even though a business which brings $120 per kilowatt-year obviously looks attractive. Before you get very far we executives, by some means, will have to be "sold" on the idea that domestic diversity is a fact and that it means real dollars and cents.

If we are going to do the job and give complete home service, we must do it in a big way. It will take forever if we plod along selling a range here and a water heater there, while our customers are getting restless and talking about what they could enjoy at Ontario prices if it were not for the avariciousness of the "power trust." And all the time it is within our power to electrify their homes at so reasonable an operating cost as to meet their requirements completely.

However, as I have said before, your first job is to sell the realization of our possible domestic diversity to your own executives—and you might just as well begin to tackle that task now as later. Whatever we may say for publication, the fact remains that the majority of us have not today an abiding faith in the existing potential domestic diversity and what it means in earnings.

Public Contacts

By MARTIN J. INSULL
President Middle West Utilities Company

Employees can aid industry through effective use of their opportunities.

An informed and militant attitude necessary.

Give the answers to inquiries.

IT IS not surprising that our industry, affected as it is with a great public interest and touching the lives and pocketbooks of more than 80 per cent of the homes of America, should be singled out as the first essential industry to be attacked by those who would turn the country from the paths and policies laid down by its early leaders and pioneers—policies which have brought it to a position of leadership among the nations of the world. The very fact that so many voters, and particularly so many voters' pocketbooks, are touched by our activities attracts the attention of those to whom President Hoover referred at Valley Forge on Memorial Day. Mr. Hoover said:

> For the energies of private initiative, of independence and a high degree of individual freedom of our American system we are offered an alluring substitute in the spurious claim that everybody collectively owes each of us individually a living rather than an opportunity to earn a living and the equally spurious claim that hired representatives of a hundred million people can do better than the people themselves in thinking and planning their daily life.
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> Amid the scene of vastly growing complexity of our economic life we must preserve the independence of the individual from the deadening restraints of government, yet by the strong arm of government equally protect his individual freedom, assure his fair chance, his equality of opportunity from the encroachments of special privileges and greed or domination by any group or class.

It may be well that our industry is the one chosen for the attack. Its very characteristics that make it attractive to those attacking may be and can be the instruments of their defeat. If, in addition to the glorious pages of accomplishments in the social and industrial developments of the nation, we can add those of our industry's successful defense of the national principle of personal initiative, which is the foundation upon which the nation's development has been built, then, indeed, may we be proud to have had a part in such an industry.

Our transmission lines carry electricity to virtually every hamlet in the land and daily to more and more of its farms. The industry's loyal and energetic employees in one department of our business or another are in contact with more than twenty million homes out of the twenty-eight million in the country. To these homes they bring all branches of the unusual and useful service that we have built up for their convenience. This efficient, active, human machine has made our service as attractive as possible to the homemaker and to industry so that more and more of our output is used, and this diversified use of our physical equipment, through greater use of our service, leads, as surely as dawn follows night, to reductions in the rates for that service to the mutual satisfaction of our customers and ourselves.

How well that human machine has functioned! The record of our industry—from the day that Edison started its first central station in Pearl Street, New York, till today, with stations of hundreds of thousands of kilowatts capacity, with networks of transmission and distribution lines covering the land, with continuously improving quality of service at constantly reducing rates—stands as mute but active evidence of this industry's accomplishments for national good.

But what an opportunity we have now before us for the greatest national service of all in helping to defend the country against the temptations referred to by President Hoover at Valley Forge! "Numerous are the temptations," Mr. Hoover said, "under the distress of the day, to turn aside from our true national purposes and from wise national policies and fundamental ideals

of the men who builded our republic. Never was the line of the rosy path to every panacea and of easy ways to imagined security more tempting."

Against these temptations our human machine—the hundreds of thousands of employees—should spring to the defense of their industry and their nation. No industry, to my knowledge, has a more energetic, more intelligent, more loyal or a higher class of men and women at its command than ours. They are of the people. They understand the people. They know their thoughts—they have their confidence. What an organization to have in an emergency to work for the national good! Are we executives making the organization effective in this work? This organization looks to us for its leadership. Are we giving it the leadership it has a right to expect? Or are we just "pussyfooting" while those who would upset those national policies that have built the nation are by their very aggressiveness against us making breaches in the ranks of our defense?

A united attack on detractors

Naturally, in an industry as large as ours, made up of independent units, there is more than one school of thought, and each school is entitled to its opinion. The school for which I take the liberty of speaking today is best exemplified by the message Marshal Foch sent back to headquarters at the battle of the Marne: "My right has crumpled, my left is in retreat. I am attacking with my center." What we need now is to attack with a center made up of every man and woman in the industry, properly organized and armed with correct information against those who would turn us from "wise national policies."

We have already waited too long since our right crumpled in the reading of a few ill-advised personal letters of publicity directors before the Federal Trade Commission, and since our left retreated in the disbanding of most of our committees of public utility information. This is a country of free speech for all—not only for those who tear down, but equally for those who are trying conscientiously to build up. Every one is entitled to his opinion, and to the expression of it, as long as he doesn't overstep the laws.

The Hearst newspapers recently published an article by Bainbridge Colby calling the corporate structure of the Middle West Utilities Company a "mystic maze" and a "masterpiece of designed confusion." I can well imagine that Mr. Colby and others might think from the way he sets it up that it is confusing. I recognize in all his articles on power questions a prejudice that leads him into the error of referring to it as "designed confusion." It is therefore not surprising for him to overlook that what is confusing to him may be perfectly clear to those who have taken part in the building of a great business and who "designed" some of the structure in order to provide better the large amount of yearly new money required and to provide better geographical control to improve the service to the public by a utility system covering such a large area. He might say just the same thing about other holding investment organizations in and out of the utility field and make the same mistake. In confirmation of this I would refer Mr. Colby to the various bond circulars offering for sale the bonds of Hearst Publications, Incorporated, and its various subsidiary companies.

Now, we don't want our attacking center to be making mistakes. We want its members informed and understanding. We must organize them. Some must be part of our intelligence department. We must know what the people are thinking about our industry as a whole and what they are thinking about local or state utility situations in particular.

The executive of every operating company must organize his forces for the benefit of the whole industry. The day when he could say, "Everything is all right in our communities—we have the most friendly relations with our public," has gone by. That's too selfish, too short-sighted. He should know what his public think about a "power trust." Do they connect the headlines of the radical press with his company? Because, if there were a "power trust," his company would be part of it. He must visualize that there is possibly a local consciousness and a national consciousness regarding the questions affecting our industry in particular and those of government ownership and political operation of essential industries in general.

What is the feeling of his public about holding companies? Do they think a holding company bleeds the local company of something that does not belong to it? Do they know the real facts—that in all probability the good service and reasonable rates they are receiving are the result of the financial assistance and the technical advice that the local company has received from the holding company that has invested its money in the common stock—the security carrying the greatest risk—of that company?

What are his public's thoughts, if any, on the much discussed questions of valuation and security issues? Do they understand that utiliity rates are not based on security issues, but on the value of the property used and useful in the public service? That being so, are they satisfied with the basis of valuation laid down by the Supreme Court, or do they want a valuation based upon some other principle?

What do the people think?

Do his public think regulation has broken down? Do they know that when Governor Roosevelt talks about making large savings in the cost of electricity, so that even the poorest can enjoy its advantages, he is talking about an average domestic bill of 9 cents a day—and of only about 5 cents per day to a very large portion of the domestic consumers? Do they think the cost of electricity is increasing, as one might imagine from what they read, or do they know that the price has decreased 30 per cent since 1913? Have they any idea that $6 must be invested for every dollar of annual business that our industry obtains? Have they been impressed by statements made by Governor Pinchot and others—that our industry, with its twelve billions of investment and two billions of gross business, is making excessive profits to the extent of half a billion dollars per year? Do they believe that our executives are linked up with racketeers and all the worst elements of society as charged in Governor Pinchot's inaugural address?

But why tire you with endless questions of this kind? You know them as well as I do. On these and other matters vitally affecting our industry, we must know what the people—the voters—are thinking. In the finality it is the people who will decide whether the "wise national policies and fundamental ideas of the men who builded our republic" shall continue.

Ten Years of the Women's Committee

Address by Martin J. Insull at public relations session in celebration of a decade of work by this auxiliary of the N.E.L.A.

ESTABLISHMENT of the women's committee ten years ago grew out of the recognition that in almost every town women serve as the point of contact between the utility company and the public. It was realized that, numerically at least, our market is made up predominantly of women—that is, of household customers. It was perceived further that, in order to represent the company to the public, the women employees should be thoroughly informed about those important aspects of the business in which the public is likely to be interested. Some organization was necessary in order that the women of the industry might undertake a study of these important matters. Once they themselves were possessed of a comprehensive knowledge of the business, they would be in a position to deal intelligently with questions raised by customers of the companies.

Prior to that time the industry had not been any too alert to its responsibilities in this direction. It had occupied itself primarily with raising capital and building facilities. It had not paused to take the public into its confidence and to make clear the reasons for its forms of organization and for its policies and practices.

The beginning of this women's committee work symbolized the industry's awakening to its responsibilities in the direction of informing the public and of cultivating the public's confidence and cordial support. In this the industry recognized that the public's interest in it is greater than in most other businesses, because it operates under rights granted to it by the public and because it is in every sense a public service business.

The industry came to see that its distinctive characteristics must be explained. The fact that its invested capital must be about six times its annual gross revenue had to be clarified to a public accustomed to businesses which needed to invest less than half the amount of their annual business. The constant need for additional capital in the same proportion to meet new demands for service needed to be explained. The rate structures and the considerations which govern them called for educational effort. The very principle of private business had to be defended in the face of political efforts to place these public utility services under governmental ownership. There were charges that had to be met. The charge of overcapitalization needed to be countered with the fact that rates are based on property values, not on securities. The charge that the holding company was designed to extract excessive profits had to be met with the story of the holding company's actual constructive accomplishments. The effects of state regulation had to be stressed, and there was need of showing how the customer has been protected against excessive charges.

These were some of the goals for which the industry mobilized itself. The organization of the women of the

IN JUNE, 1921, Martin J. Insull's term as president of the National Electric Light Association expired, and he accepted the chairmanship of the Public Relations National Section. He had been a leader in the discussions regarding the importance of training and educating women employees. This idea took definite form when, on June 30, 1921, the executive committee of the Public Relations National Section adopted a resolution authorizing the creation of a "women's public information committee," later changed to "women's committee."

From this beginning has grown a nation-wide organization of women employees in the light and power industry, consisting of more than 800 committees under the direction of the women's committee of the Public Relations National Section, with headquarters in the offices of the National Electric Light Association in New York. The scope of the work has gradually broadened until today the women's committee is responsible for the preparation and execution of plans for the education of women employees of electric utilities throughout the United States in all of the economic and social phases of the industry. The committee also is contributing very effectively to the campaign now under way to make this a nation of completely electrified homes.

industry throughout the country, through committees in each company, was one of the most effective ways by which this information was presented to the public.

In short, the history of your committee coincides with the awakening of the electric power industry to the fact that service alone will not assure a completely sympathetic public. Good service at fair rates is the primary necessity, but not the sole one.

I have never believed that our informational work should repeat what our operations have already expressed. In other words, I do not think that after furnishing good service at fair rates we should publish advertisements saying that we have done so or go before public groups saying that we have done so. So far as our service is concerned, it speaks for itself and it speaks very eloquently and very effectively. And it goes a long way—though not all the way—in assuring public good will. There was an editorial in an important newspaper recently which expressed this very aptly when it said:

> The electric companies generally meet the politicians' attacks by giving good service at a low cost. The housewife who has been relieved from the washboard and tub by the electric washing machine is still too grateful for her emancipation to imagine any grievances. The carpet sweeper, the range, the refrigerator, water heater, ironer, percolator, toaster, hand iron and waffle iron, are all obstacles in the way of Senator Norris and Governor Pinchot.
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> It may be that in time to come, when all these electrical appliances that have done away with drudgery in the home become commonplace, we shall become cantankerous about our electric utilities, but just now it looks as if a great deal of missionary work would have to be done.

But note that in this service relationship with the customer nothing is said about the principles underlying our rate structures, nor about the accomplishments of the holding companies, nor about the dangers of government ownership, nor about the factitious charges of overcapitalization. We furnish good service and we do it cheaply—but in these controversial subjects we leave ourselves open to attack. We must get over these facts in another way. We must equip ourselves to discuss these subjects intelligently, and we must utilize every possible and proper channel to spread the facts among the public.

The great danger is that the customer may separate the "good service at fair rates" from the clamor about the "power trust." The customer may not realize the connection between her own electric service and the thing that the agitators are calling an "octopus." She may join in the attack, little knowing she is trying to kill the thing that has made her home a better place to live in.

You know better than I do what is likely to be the state of mind of the average American woman toward the great intangible organization which she knows as the "light company," or, if she has absorbed a few newspaper headlines, as the "power trust." She has no way of measuring the fair price for electric service. If she hears or reads that it is excessive, she may possibly believe that it is. If she hears a convincing argument that a municipal plant can provide service cheaper, she may be inclined to favor the establishment of a municipal plant. Or she may be told that a municipal plant would conserve profits for local use, that it would build parks and playgrounds out of profits which now go to some distant financial center. All this probably looks quite logical to her. Those who are advocating such a step do not, of course, tell her that a municipal plant is more likely to eat up taxes than to reduce them, that it is more likely to use up park and playground funds to cover a deficit than to create funds for such purposes.

Again, in this mistaken but zealous enthusiasm, nobody has pointed out that the municipal plant is physically obsolete. Nobody has shown that only the transmission system of the power company can provide service in accordance with modern technical progress. Nobody points out that the holding company in the distant financial center does not exist merely to extract profits from the town; that, on the contrary, it has sent money into the town to be invested in service facilities.

Even when the customer's service is satisfactory, she may be affected by such misunderstandings. Otherwise, how can we explain the puzzling fact that, after our ten most intensive years of serious effort to cultivate public good will, there is a louder clamor than ever about the "power trust" in newspaper headlines and in legislative assemblies and political offices?

Associate service with broader issues

Apparently we have not related the two issues. In the customer's mind we have not associated the benefits they have received from their service with the broader issues that are being discussed in journalistic and political circles. Let's tell our customers! Tell them in terms of their own service. Tell them that when somebody attacks the holding company he is attacking the means whereby the capital has been raised to provide that service. When somebody urges government ownership he is attacking the personal initiative and enterprise that has brought that service into more than 20,000,000 American homes. These questions of the holding company and of government ownership are not abstractions. They are not something separate from the local service that your companies render. They are part and parcel of the broad subject of service—as much so as voltage and continuity of service. And what if the customer's service is not fully satisfactory? Then we are doubly exposed to danger. Perhaps this woman does not know how to use some of the equipment which the power company has sold to her. Maybe such an expensive thing as an electric range has failed to give satisfaction or has proved too costly for daily use.

How will this woman act when the power company is discussed in her club? How will she and her family react to a proposal to renew the company's franchise? How can we expect her to act in any way except against us if we let her go on thinking of us in a hostile way without any effort to inform her or to show her our side of the issue?

You have done a great deal in ten years, but you have barely started. As a matter of fact, this is a work which will never be finished. A new generation is growing up, and they who belong to it, too, must be our friends. And this is a growing, changing business; that is the interesting and fascinating thing about it. That is its challenge, too. It calls for intelligence and alertness among us all, and it calls for a sympathetic and helpful spirit of service—especially on the part of those who work on the front line, where opinions are formed, where the industry's reputation is made and its fortunes determined. For myself, for my company and for the industry, I congratulate you and thank you for your invaluable help during the past ten years. I know that the next decade will be even more effective, and I wish you all success in making it so.

Refrigeration Sales Program

Outline of co-operative campaign.
Results encouraging.
Direct agency for improved trade relations.

By J. E. DAVIDSON
Chairman Refrigeration Bureau

OUR national co-operative activity, launched originally to sell only electric refrigerators and to build greater load, has become a four-pointed star: (1) Making electricity of greater service to the home. (2) Improving our trade relations. (3) Stabilizing production for the manufacturers of electric refrigerators. (4) Building greater load for the light and power companies.

The plan for this nation-wide activity had its inception just about a year ago. During the summer the plan took definite shape and in the late fall of 1930 was approved by this association.

At the outset several conferences were held, with the result that the officers of the Frigidaire, Kelvinator, General Electric and Westinghouse companies made the generous commitment of $1,000,000 to care for the national expense of a three-year program, with the immediate aim of selling 1,000,000 refrigerators in 1931.

Also, there was established at N.E.L.A. headquarters an electric refrigeration bureau, with a full-time director. Commercial Director Greenwood and his office have devoted the major portion of their time during the past few months to this activity. Field men were sent out, so that every state in the Union has been contacted, either by Mr. Greenwood, Dr. Allison, the field men or myself.

Quite naturally it followed that in formulating plans calling for a co-operative selling movement on the part of keen competitors there were many obstacles to overcome. Other selling agencies were invited to participate, and we now have, besides the electric light and power companies and the refrigerator distributors and dealers, the hardware, furniture, department and other stores selling electric refrigerators taking part in this activity. The fine sportsmanship evidenced by every one concerned stimulated and encouraged us in carrying out our plans.

Following the generous offer of the refrigerator manufacturers, an executive committee was organized, composed of some of the best minds of the refrigerator manufacturers and the electrical industry, together with staff officers from N.E.L.A. headquarters.

The next step was the organization of a planning committee. We were very fortunate in having as members of our planning committee interested and alert advertising and selling experts of the manufacturers and electric companies. This committee worked diligently over a period of six months, preparing the national and local plans—the finest I ever saw for any activity.

Our co-operative activity was divided into three selling groups—spring, fall and Christmas. Special advertising and sales promotional materials have been prepared to conform with these selling seasons.

Our field organization began with the appointment of regional directors for each of the thirteen N.E.L.A. geographic divisions. It was encouraging for us to obtain men for these position who are ranking officials of the utility companies with which they are connected. These gentlemen, in turn, appointed state directors in their division who are management or commercial executives of their respective companies.

The completeness of our organization is best illustrated by the fact that an electric refrigeration activity is now being conducted in practically every community of every state, and also by our Canadian neighbors and in far-off Hawaii.

The plans call for the expenditure locally of 10 cents per domestic meter, which equals approximately $2 per refrigerator of expected sales. Local electric refrigeration bureaus in just thirteen cities have definitely appropriated for purposes of their local organizations an amount in excess of the total commitment by the refrigerator manufacturers to support the national bureau for the first year of the three-year activity. It is interesting to add that New York, Chicago and other large cities that are spending liberally are not included in this list.

Further plans to include at least one or more co-

operative electric shows or exhibits were made. Reports come to us of such shows held in many of the larger cities and smaller towns. In each instance it was evident that the electric show aroused keen interest, the attendance was beyond expectation, and it was instrumental in increasing refrigerator sales.

In connection with shows to be held this fall, the Commercial National Section is just about to issue a special detailed booklet entitled "Co-operative Electric Refrigeration Exhibits." This booklet gives complete information, from the putting up of booths to publicity and advertising in connection with such co-operative electric show or exhibit.

In order to provide experienced and expert advertising counsel for the planning committee, the Lord & Thomas and Logan advertising agency was retained. This agency immediately made a field survey in order to ascertain the information necessary to determine the nature and form of the advertising and sales promotion which is now playing an important part in this campaign.

Guided by these facts, the planning committee, joined by the advertising agency, prepared national magazine advertisements, local newspaper advertisements, sales promotion aids and a prospectus of the general plan. Within the brief period of thirty days the prospectus was completed and 3,000 copies distributed to those interested.

Shortly afterward a complete plan book was created and was ready for the printer, to be distributed shortly after January 1. Just at that time it became evident that the activities of the electric refrigeration bureau, including our slogan to be used in this plan book, had run counter to certain opinions held by the ice companies.

Propitiating the ice companies

While none of us felt that their criticisms were justified, we did not want to leave a stone unturned that would cause unfriendly feelings as a result of this co-operative activity. A parley was held with representatives of the ice industry and the printing of the plan book and the other promotional activities were suspended temporarily.

As a result of this parley our original slogan was changed to read, "Invest in an Electric Refrigerator." Changes were also made in the wording of our national advertisements, local newspaper advertisments and sales promotional material.

With these concessions oil was poured upon the troubled waters and the board of directors of the National Association of Ice Industries passed a formal resolution expressing its appreciation of our co-operation.

From all parts of the country we have received letters telling us enthusiastically of the immediate effect of this co-operative selling activity in improving trade relations. Men who even as late as a few months ago thought they were business enemies are now breaking bread over the same table, co-operating in selling, and because they know each other better and have a realization of each other's problems, there is a clearer understanding all around. In many instances we have received reports that this activity has been made permanent and has been developed to take in the co-operative selling of all electrical appliances.

Without question the electric refrigeration selling activity offers a concrete, immediately available vehicle for solving trade differences as between utility companies and other merchandisers and the substitution for these differences of a concerted sales program in which every one taking part can reap benefits.

Let me say again that if this activity does nothing more than stimulate greater co-operation among the electric light and power companies and the rest of the agencies selling electrical appliances it will be worth the time, energy and money expended in its developments.

Even so, from the material side also, this activity is well worth while. I am confident we will reach our goal of 1,000,000 refrigerators, and this will bring approximately $30,000,000 in additional revenue annually to our companies. This is a timely business because, without increased property investment and with but little increase in operating expenses, it will bring this increased revenue, needed now in offsetting some of the losses of electric energy consumption as a result of curtailment of factory production.

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Eight Hundred Organizations of Utility Women

By CLARA H. ZILLESSEN
Chairman of the Women's Committee

SINCE its organization the women's committee of the National Electric Light Association has formed approximately 800 local organizations of women public utility employees, each one consisting of all women employed by local electric utilities and directed by a permanent or temporary chairman, chosen by the women themselves or by the management. The purpose of these organizations and their regular meetings is the education of the women in every phase of the business, so that they can deal intelligently with their companies' customers, both in their business and social contacts.

At the beginning of each association year a suggested program of activities is sent to all local women's committees by the national women's committee. Last year's program included five general topics:

1. Economics of the utility industry.
2. Electricity in the home.
3. Safety and first aid.
4. Courteous service to customers.
5. Organized public contact work.

With the increased attention being paid generally to the intensive development of the residential load, the study of electricity in the home has been eagerly welcomed by the women and has proved of great value to the companies commercially. Probably the most important contribution of the women's committee has been the sponsorship and the establishment of "home service"—a definite asset in dollars and cents as well as good will. Home service departments, in charge of specialists in the relation of electricity to home processes, are established to assist in creating and maintaining satisfactory customer relations and increasing the sale of kilowatt-hours to the home, as well as of new household electrical appliances. The number of such departments has increased from less than 50 in 1926 to more than 400.

Brakes on Prosperity

Increasing interference of government in business to be fought.
Burdensome cost of administration reflected in stifling taxes.
A time to call a halt.

By C. E. GROESBECK
President Electric Bond & Share Company, New York

NO NATURAL catastrophe, no war, no pestilence has changed the United States of 1928 into a poorer country. Yet everywhere there is today a feeling of doubt and hesitation which shows that somewhere, somehow, brakes have been set upon the natural human urge to go forward.

One of the most serious brakes upon returning prosperity, one of the many causes of our present situation and one of the factors which must be considered in any general movement toward better things is the fear of further infiltration of governmental dictation into the life and labors of the American people.

Government did not build the clipper ships that carried the American flag over the seven seas. Government did not develop the cotton gin, the telephone or the steel industry. Government did not help Henry Ford to produce his automobile or toil with Edison to evolve the electric lamp.

Within the last few decades, and particularly in the last twenty years, while the nation has been carrying on with the accumulated momentum of more than a century of individualized progress, a serious change has crept into the relations between the citizen and his government.

While industry has been intent upon development and expansion and labor has been enjoying the highest real wages and the best living conditions achieved by any nation since history began, the insidious encroachment of government control over, and government competition with, the business of its citizens has become increasingly manifest.

Undeterred by their experience with the railroads, the official and unofficial advocates of a governmentally controlled Paradise moved on to find new fields to conquer. In their effort further to inject government into business they have been aided by the creation and multiplication of boards, bureaus and commissions with varying powers to regulate and control private enterprise. In the last sixteen years, for instance, permanent bureaus and commissions, employing, I am told, 30,000 persons, have been set up by legislative fiat in our federal government, and state governments have extended their activities in a corresponding manner.

Through these boards and bureaus, through commissions clothed with the power and authority of the government of the United States and of the several states, government has taken from the individual business man much of his freedom of action and has circumscribed his ability to develop a clear and courageous program for the conduct of his private business.

There can be no question that this government interference has sapped the power of American industries to resist untoward developments and has impaired their ability to spring back quickly from temporary slumps.

"Fear is not conducive to progress!" This is a text to which every industry in the country can subscribe. Fear of government. Fear of government competition. Truly, if such fear is conducive to anything, it is conducive to delay, to timidity, to loss and to unemployment.

Many of our industries, in one form or another, already face direct government competition. The insurance companies have suffered government competition for years in various lines of insurance. The grain dealers of the country have been practically driven out of business by the Federal Farm Board and the Grain Stabilization Corporation.

It is not only the large and far-flung industries that have felt the heavy hand of boards, bureaus and commissions or have experienced the effects of government competition sanctioned by the action of legislative bodies. The country printer with his job press has protested in vain against government invasion of his business through printed envelopes and return cards, prepared, distributed and sold under government auspices. Dealers in coal, oil, gasoline and other commodities face government competition where states and municipalities are usurping their functions and undertaking the sale of these commodities at so-called cost. There is no need to multiply examples. The virus of government interference with private enterprise has spread so far that only those who are willfully blind can fail to read the signs of the disease.

With approximately 5 per cent of the world's population, we have accumulated here, under a system of individual enterprise, half of all the railroad mileage in the world. We have three-quarters of all the telephones and nine-tenths of all the automobiles. Even in the midst of our present depression, the people of this country are better fed, better clothed and better housed than any other people on the face of the globe. Yet these are the conditions which the advocates of government dictation are seeking to change. As a substitute for the energy and genius of private management which has endowed this country with the world's most progressive and most highly developed industries they would bind business with the red tape of bureaucracy while they tax it to supply funds to pay the deficits of government competition.

Taxation mounting dangerously

In addition to the burden on business through government control and competition there is, besides, another and an increasing handicap which is weighing down the efforts of private business to restore the prosperity of our trade and commerce. I refer to the ever-mounting, ever-increasing burden of federal, state and local taxation, which today is consuming nearly one-eighth of the aggregate productive income of all the factories and farms, of all the stores, trades and professions and of all the workers of the country.

Each extension of governmental activity must be paid for in taxes. Each new board and bureau established in federal, state or local government must be paid for by an addition to the tax levy.

In the last analysis, the largest part of all revenues that governments secure are paid not by the seller but by the buyer. And when we speak of buyers in this connection we mean the American people as a whole. In 1913 government took in taxes from the public $22.66 for each man, woman and child in the United States. In 1929, or sixteen years later, government took $80.58 per capita, or 255 per cent more. Today at least one person out of every ten employed is carried on some government payroll.

No one can quarrel with the cost of supporting government in what it is doing, and doing well, within its proper sphere; nor would we depreciate the splendid work being done by many in government service who, engaged in the fundamental things for which our government was formed, are giving their lives to the common good at a compensation far below their merits. It is the extension of government beyond its proper limits into the affairs of its citizens, competing with them, taking from them the free play of their initiative in the management of their business, to which the citizen rightfully objects.

The stability of government itself is threatened when it abandons the rôle of arbiter in the field of business and steps down into the marketplace to barter and sell the things which give its citizens their livelihood. And government on many occasions has learned the dangers which lie in such a course.

Australia an example of bankruptcy

The experience of Australia is one which this nation can profitably study. There government in business has been given a thorough trial. Australia has traveled far around the vicious circle of government ownership, more officials, fewer taxpayers and higher taxes to which some would commit the United States. And within the last few weeks the daily press has carried the story of the refusal of the largest bank in Australia to honor the check of the Australian government. The vicious circle has led to the verge of government bankruptcy. National bankruptcies are no more impossible than bankruptcies of individuals and corporations. The results are far more disastrous.

Here we are still able to carry one man out of ten on our backs. Our credit is still good. But, with the expenses of government increased more than 300 per cent in the past sixteen years while the national income has increased less than half that percentage and with an increase in population of less than 26 per cent, we may well take stock of our own position and of the proposals of those who would bring the government into further business competition with its citizens.

In one Mid-Western state for the year 1928, a year which we regard as a prosperous year, delinquent taxes, state and local, on farm land and village lots amounted to $28,000,000, and this year more than 400,000 parcels of property are being sold to pay those delinquent taxes. And this is happening in one of our strongest and richest states.

I take heart in the signs I see on every hand that the great, silent body of the American people, the earnest, working, producing majority, is becoming alive to the fact that a minority is attempting to change their government and government's attitude toward their labors. When this silent majority express themselves our representatives will listen. And the message they will hear will be emphatic and to the point.

That message, unless I much mistake the temper of the American nation, will be that government interference with private enterprise is paternalism, that taxation for paternalism is tyranny, and that an aroused and intelligent people will not permit this noxious growth to embarrass their progress and impair their prosperity.

Virginia Electric & Power Co. Wins Coffin Award

AN ANNUAL feature of the convention is the presentation of the Charles A. Coffin prize at the public policy meeting. This year the award was granted to the Virginia Electric & Power Company by the prize committee. In presenting the award to J. G. Holtzclaw, President W. A. Jones stated that this company was rated 95 out of a possible 100 points by the committee. Some of the accomplishments during the current year were as follows:

The number of customers was increased 5 per cent, the average consumption of energy was increased 15 per cent, rural business was sought aggressively and the number of rural customers was increased 40 per cent, a promotional rate for the development of domestic business was instituted, and through splendid engineering the system capacity was increased at a very low cost per kilowatt.

Stabilize Employment

By GERARD SWOPE
President General Electric Company

Utilities can lead the way in employee relations.

Planned expansion of properties would smooth load curves.

Suggested approaches to stable employment.

GREAT questions that this economic depression has brought to the fore are stabilization of industry and stabilization of employment. The public utilities can bring to these questions not only enlightened and intelligent analysis but very definite assistance as to how these problems may be solved, at all events in part, and can really occupy a position of leadership in so doing, because of the many advantages inherent in the character of their industry.

The first thing for the utilities to do—one which is already done to a large extent—is to look ahead and plan their work so as to be able to tell other industries well in advance what utility requirements will be, thus enabling the manufacturers to plan their work on a more uniform basis of production.

There is, however, another responsibility, and therefore opportunity, for the industry, and that is to its quarter of a million employees throughout the country. Here the public utilities have, in a way, their greatest opportunity for leadership. Their problem is simpler than that of most industries, with their business showing less variation from year to year and that variation usually upward. What the industry wants is to attract to its service the most intelligent employees, who will make this their life work, and at the same time to free their minds from worry, thus enabling them to give the best they have to their work and, as a result, provide the best service to the public.

The primary conditions upon which the most satisfactory structure is built in any industry are conditions of work, hours of work and compensation. In all of these the public utility industry compares most favorably with others.

The important questions that young people ask themselves and one another on entering any industry are what the opportunity for advancement is and how steady the work will be. They do not know what we know, that there is a great opportunity for the individual and that with the growing field for people who apply themselves there is every opportunity for steady work. It might be asked then, "If such is the case, why do more?" But when young people enter industry they must learn these things by contact and experience. They have no authoritative statement from the company and therefore their minds are troubled and they worry, and especially do these troubles and worries seem greater if they have, or later take on, responsibilities. The aspects of life's question of which they think constantly are how to make provision for these responsibilities by, first, insurance against the uncertainty of life; second, provision for old age, and, third, assurance of steady employment or amelioration of the tragic circumstances of unemployment.

Something has been done in this industry and other industries on the first two problems—very little, in this country, on the third. There has been so much consideration given to it now that unless industry finds a way the government may feel itself compelled by public opinion to endeavor to solve the problem. If it is done by the states, then the cost will be distributed through taxation and there will be no economic restraints either on the collection of the funds or their distribution.

Stabilization rather than insurance

Indeed it may be that the public utilities can work out this problem of stabilization of employment rather than unemployment insurance, which, of course, is much more to be desired. This becomes largely the responsibility of management, but even in this case the co-operation of the employee should be enlisted so that his interest may be aroused, he may co-operate and that he may be fully cognizant of what the solution of this problem really means.

A number of states have already passed laws providing for old age from funds collected by general taxation. Public utilities, as well as other industries and individuals, contribute, and distribution is made on the basis of the attainment of a certain age and a certain period of residence within the state. The plan seems to put a premium on not acquiring a competence in that such assistance is given to individuals only if they have accumulated less than a certain amount of property. Furthermore, the provision is so small that all that can be said for it, possibly, is that it is better than nothing. It is neither scientific in method nor adequate in amount nor satisfying to the recipient.

Life insurance and old-age pensions, in their inception, were started by industries without contribution from the employees, largely with the motive of reducing turnover and in this way reducing costs. The employees, of course, accepted these things without questioning, because they were something given to them and involved no responsibility on their part. They may have said, "Thank you," but they had no real interest in them, and these plans could not and did not take the place of adequate compensation. Therefore, as a result of experience, it seems to me that the best basis for a study of these broad questions is, first, joint consideration by employees and the company; second, joint contributions, and, third, joint participation in the administration of the plan.

Let the electrical industry lead

If these are joint undertakings between the company and employees, almost every question that comes up will be thoroughly considered and a wiser solution found. If they are supported by the critical analysis and acceptance of the employees, the administration of the plan, largely in the hands of the employees, will usually be more effective and more generally accepted than if done by the company. In other words, a plan where you have co-operation between company and employees, where things are done by and with employees and not for them, will usually work out more satisfactorily to the employees, to the company and, in the last analysis, to the community.

With a regulated industry such as the electric public utilities, the statement has been made that the margin of profit is not sufficient to undertake such far-reaching plans. Indeed, the cost of life insurance, pensions and unemployment insurance that the company bears is really and essentially a part of the cost of the service it renders, and no community would question such elements entering into cost of service. As a matter of fact, in 1928 the Interstate Commerce Commission adopted a rule whereby railroad companies paying pension benefits to their employees may charge the cost to operating expense, thereby using the amount of outgo for rate-making purposes.

Reasoning from analogy and experience in other industries, it is felt that, under the plans in question, the employee would approach his work with a mind free from care and worry, he would throw himself into the work with more enthusiasm, his ingenuity would be aroused to find better ways of doing things, and he would not only get greater satisfaction from his work but the unit costs would probably be lowered or in any event would not be likely to be increased.

The electrical industry has in the past in many respects been in advance of any other industry in the United States and in the world. It is now a question of not only giving thoughtful consideration to what has been done in other countries and in this country by various states and individual companies, but of enlisting the best thought of the industry in the adoption and extension of these plans on a more comprehensive basis. These plans should be sufficiently elastic to cover the transfer of employees from one company to another in the association, without loss of the rights and benefits that they have acquired.

A solution of such problems may make an even greater contribution to industrial progress than any the National Electric Light Association has made in the past, and it may be the light to lead us out of this fearful morass in which we find ourselves. The public utilities have always had the vision to see the future and the courage to embark on uncharted seas.

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Digest of Public Policy Committee Report

WE HAVE an unshakable faith in the genius of American enterprise to work out its own salvation to the glory and honor of the nation: To that end constructive and co-operative effort is more essential than governmental and legislative panaceas, which too often are not only ineffective but involve the sacrifice of vital principles and surrender of individual liberty.

We urge that such regulation as may be found justified should be free from ulterior or unwise objectives and calculated not only to preserve the progress and usefulness of electric service to the public but to continue and amplify that service to the end that it may contribute its share to our civic, industrial, domestic and rural growth.

The public policy meeting, at which this report was presented by P. S. Arkwright, was featured by an address by Arthur Brisbane and delightful entertainment features, including songs by Jessica Dragonette, selections by Vincent Lopez and his orchestra and duets by two Indian stars of "The First American."

Arthur Brisbane's Points

Let small consumers share more of the benefits of electricity.

No revolution can occur in America because Americans want to run their own affairs and not have others run them.

Utilities should finance customer extensions and not ask their customers to do so.

Diesel engines may give competition to power companies and reduce the number of their accounts.

Utilities should demonstrate to the public the fact that they are trying to get power to their customers as cheaply as possible.

Selling Public Relations

By H. P. LIVERSIDGE
Vice-President Philadelphia Electric Company

Sales volume depends on public relations and trade relations.

Major points in sales and service from policy angles.

Informed salesmen and co-operation urged.

PUBLIC relations, from one viewpoint, may be regarded as a barometer of public acceptance of our service. This acceptance may be good, bad or indifferent; but no matter what the relative status may be, we must realize that the matter is largely within our control, and that our business expansion—shall I say our whole future progress?—will be dependent to a great extent upon the nearness to which our contacts with the public approach perfection. Our public relations problems arise from two sources. One of these embraces problems which are not our proper heritage but are, so to speak, thrown at us from the outside—problems which do not arise from the operation of our business but come from critics having motives to which our business is but incidental. These are artificial or political public relations problems. The second class embraces our natural problems, over which we have a large measure of control and which are incurred in the routine rendering of a necessary service to great masses of people. It is to this second classification that I wish specifically to direct your attention today.

If we are to develop our future sales program successfully, the personnel of each individual company, every man and woman engaged in the detail operation of its business, must be taught to appreciate his or her responsibility as a representative of the company to the citizens of the community. The employee must realize that in so far as the customer is concerned he is the company and his contact must arouse the same feeling of satisfaction as if that contact were made by an executive of the company. In the rush and whirl of business life there is too great a tendency to devote the major attention to obtaining contracts for service and too little attention to keeping the customer "sold" after the introduction of that service. The entire future business relationship with the customer, the revenue which the company expects to receive for an indefinite period, is wrapped up not only in rates and reliability of service, but in the continuing friendly relation which must be maintained in the run-of-day contacts.

The problem has many angles, as we serve many classes of customers. In the case of large power users our relations are, in general, quite satisfactory, provided always that our rates are reasonable and the service is adequate. For many years we have diligently devoted ourselves to a study of the problems of the large industrial and commercial consumer. Its result has been a marked degree of mutual understanding and appreciation. On the other hand, the problem as it relates to the small business and domestic field appears much more complicated. Our contacts are usually few and far between—oftentimes inherently unpleasant—having to do with service troubles, metering, bill adjustments and the like. Here we meet the situation of the customer who has a grievance, either imaginary or real, and the employee, who only too often is not broadly sales-minded, is lacking in a satisfactory understanding of company policies and is either too busy with routine work or has not the personal characteristics to represent the company satisfactorily in his dealings with the customer. Such contacts invariably lead to misunderstanding, and personal antagonism is oftentimes the direct outcome. It is this lack of understanding on our part, combined with misunderstanding on the part of the customer, that lies at the bottom of this problem.

External trade relations

In considering the subject from the external or public standpoint, there are many avenues of approach which are as yet far from being satisfactorily developed. Let me mention just two important groups:

1. The relation with other electrical interests.
2. The relation with architects and builders.

Referring to the first, the day has passed when the

electricity supply company can be regarded as the electrical industry. It is only one part of the industry. In each community we have a great organization of manufacturers' representatives, contractors, distributors and retailers, all of whom have a most important part in the development of electric service. The utility problem in any community is their problem, and there is a joint responsibility in seeing that there exists a mutual understanding in the development of the business and a satisfactory relationship between the whole electrical industry and the individuals of the community which they serve.

If the relations between the public utility and the other electrical interests are not satisfactory, then I will say to you that your public relations are not what they should be and your sales development is hampered accordingly. Every one of these interests should know intimately the personnel of your utility; know you personally as sincere, honest men and women; have confidence in you, in your fairness and uprightness in business, because they judge your whole organization by their opinions of you and the relatively few other company representatives they know.

Working with architects and builders

In our relations with architects and builders, particularly architects, again there is a considerable lack of understanding of each other's problem. The architect will tell you that his responsibility to his client requires a working knowledge and understanding of all the factors which enter the design, construction and equipment of buildings. Of all these, few, if any, are more vital to the comfort and convenience of the occupants than provisions for the utilization of electrical energy. And yet I doubt very much whether any individual architect has received through the co-operation of the electrical industry—not the electric supply company alone, but the industry as a whole—the actual information which he feels he should have in order that he may satisfactorily serve his client with a knowledge and full understanding of what the electrical industry considers the best current practice in the use of electric service. I have been impressed with the apparent lack of appreciation and understanding which the electrical industry has in regard to the problems of the architect. We have attempted to prepare for him at various times so-called specifications covering lighting requirements, wiring layouts and equipment data. In fact, the average architect's office today appears to be confused with a maze of statistical information emanating from almost every conceivable source in the electrical industry. These are on the whole without any plan of presentation. Most of them apparently stress illumination or lighting circuits, and many of them are fragmentary as to the utilization of electricity in general.

From my personal observation the architect seems to have reached the conclusion that since he cannot understand what it is all about, and as there is a wide discrepancy in available information as well, the industry itself doesn't clearly understand the essentials for the complete electrification of buildings. If the architects of this country are to create structures so as to give us the opportunity for unrestricted sales in the future, it will undoubtedly have to be accomplished through a better working understanding with them than we have today, so that, with the inception of their plans, adequacy of distribution and outlets will be provided. As a practical thought, let me suggest that the Commercial National Section take steps to set up some form of contact which will bring it into close working arrangement with one or more architects of recognized ability, who will thus be in a position to guide us in formulating methods of procedure as well as in the preparation of practical, usable data and information.

All of these various contacts with the public, therefore, simmer down to a matter of public understanding, and this, in turn, depends on education backed by a program of personal contact and service. I firmly believe there is no general mass resentment on the part of the public in so far as our service is concerned. The individual customer, however, appraises the utility in terms of his personal experience, and if that experience has been unsatisfactory, the company is judged accordingly. Our attention, therefore, must be primarily directed toward minimizing unsatisfactory opinions and the development of confidence on the part of the individual customer. This is a problem which must be backed primarily by a sound, broad-gage company policy and be corrected through the proper selection, training and direction of the utility personnel. One clerk, meter reader or service man can cause more ill will in a moment of thoughtlessness or careless performance than a group of executives can right in a day's business, and the pity of all of this is that seldom do such cases get to the point where they receive the attention they deserve. In the meantime that one aggrieved customer is actively spreading his feeling of grievance and resentment to an ever-widening circle of friends and acquaintances, while the company has no direct way of correcting the effect of that thoughtless employee's mistake.

Bills start the contact

Our principal conscious contact with our customers is the bill. Back of those wires is the vast and complicated system of plants and substations, the transmission and distribution lines, with which we are familiar, but of which the customers, to all practical purposes, know nothing and probably care less. We speak to them with the bill. We are the bill and little else. And when they observe that the bill grows higher they grow resentful. If we do not now make clear to the domestic customer the relationship between increased use and higher bills, what will our position be if we succeed, as we confidently expect, in doubling the average domestic customer's consumption? We must draw from this fact one specific and significant inference: *It is the job of the salesman to make clear what enters into that bill.*

A word on merchandising practices. Here is a potential source of trouble. Whether the utility should or should not merchandise is beside the point. The real question is, *How* does the utility merchandise? Of one thing I am absolutely certain: that unless merchandising programs and policies are developed on a basis of fair and intimate understanding with all others engaged in electrical merchandising, unless they are absolutely free of any practices which might be construed as unfair or discriminatory, no matter how urgent the need for such a policy might appear, we are building up for ourselves a sales resistance that will counteract all the tangible progress we are making.

Close co-operation therefore with established dealer outlets toward greater total volume of sales seems the surest and safest plan to follow. Take the lead in promotional activities of those appliances that are the most

difficult to sell and back the independent dealers in building a larger volume of general appliance business. You will in all probability be most definitely rewarded in the future.

Appliance servicing is another matter of major importance in its bearing on public relations. Primarily, the electric company is interested in seeing to it that the appliances in the home are kept in use. It must be in a position to render such service as is necessary when it cannot be satisfactorily provided from outside sources. Here, again, it is not so much a question of cost of such service, providing that at all times it is reasonable, but rather that such service when rendered is done quickly and pleasantly and leaves with the customer an impression that in the doing the company has bent its every effort to deal with the individual as if he were the only customer served by it.

Conclusions for action

Summing up the examples which I have presented in a rather disconnected manner, it would appear that the industry's chief difficulty comes from (1) the public's disbelief that it is protected from us in our form of monopoly, (2) the public's further belief that we are in command of a mysterious force of nature about which the customers are so utterly ignorant that they conceal the fact while retaining inwardly a very natural feeling of resentment at being, as they assume, at a disadvantage; (3) our reputed "cleverness" at bookkeeping so that we are "always able to make figures come out our way," and (4) a seemingly minor detail of the larger problem, namely, that we are ever willing to cut off service quickly in cases of dispute or delayed payment.

From a practical business standpoint it is far easier and less costly to sell to a satisfied customer; therefore the mental attitude of the public and its opinion of the utility must be a most important consideration in our future program of increased sales. From the time the contract for service is signed or selling begins in earnest we must not only live close enough to the customer and serve him as he expects to be served, but we must develop and maintain a personal contact that will permit him, when he thinks of the utility in relation to his individual requirements, to picture us, not as a single corporation, but rather as a group of individuals, each one striving to do his part in the service to the public; think of the company in terms of that personal confidence which he has gained through contact with our representatives.

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$2,000,000,000 in Preferred Stocks to Be Issued in Ten Years

By JAMES B. BLACK
Chairman Customer Ownership Committee

NO CUSTOMER ownership campaign which violates any one of the ten cardinal principles adopted by the customer ownership committee in 1925 can be conducted successfully. Efforts should be made to sell stock to customers in small amounts, with the object of continuing, in an increasing degree, to make every stockholder a permanent friend.

Only securities whose safety of principle and rate is relatively assured should be offered. Choice of preferred stock has been well justified, as an analysis of the records of the more important operating and holding companies shows at this time only one issue of preferred stock on which dividends are not being paid at the full rate. It is extremely important that each company keep its shareholders fully informed of the company's affairs at frequent and regular periods.

Customer-ownership stocks have weathered the financial stress with relatively small fluctuations in market price, and their possession by so many individuals is a sound contribution to the economic welfare and progress of both stockholders and companies.

The great popularity of public utility stocks is indicated by the fact that the number of stockholders of individual companies increased from 10 per cent to over 100 per cent in 1930 compared with 1929. The average gain for the industry in 1930 was well over 25 per cent. Ownership of public utilities has been passing into the hands of the small investor, thereby creating a true public ownership under public regulation without sacrificing the initiative and efficiency of private management. Customer-ownership activities have been a most important contributing factor. With these increases in numbers of small holders the responsibility of management increases proportionately.

Customer ownership sales reached a peak in number of shares sold (3,581,206) in 1927, and in number of stockholders (294,467) during 1924. In 1930 1,698,000 shares were sold to 115,013 stockholders, an increase of 250,147 shares and 27,515 stockholders from 1929. More than 1,500,000 individuals now own stock of electric light and power companies, it is estimated.

Changes in the money market and the popularity of individual classes of securities caution against the expectation that customer ownership sales will increase steadily each year. However, it is quite certain that approximately 25 per cent of the capital required for investment in the electric light and power industry will come from the sale of preferred stocks, and a very large part of this should, and no doubt will, be supplied by customer owners.

To proceed adequately in the development of new or partially developed fields it is necessary for the industry during the next ten years to raise not less than $7,500,000,000 in new capital, even ignoring reinvestment of reserves and surplus. Of this approximately $3,500,000,000 will no doubt come from the increase of long-term debt, $2,000,000,000 from the distribution of common stocks, and $2,000,000,000 from the sale of preferred stocks largely through customer ownership campaigns.

What the Engineers Are Doing

By ALEX D. BAILEY
Chairman of the Engineering National Section

IN AN article in the August 7, 1930, issue of the *Public Utilities Fortnightly* James H. Collins says: "Utility men are engineers, restrained by financiers and guided by attorneys—all inward-turning men. They explain in reports, balance sheets and legal decisions." Engineers particularly are supposed to belong to this class. Being completely occupied with technical details, they fail to get the broader view—"they cannot see the woods for the trees." It is very evident, however, that engineers are beginning to appreciate their duty and responsibility in the economic set-up of an industry such as ours and the relation and importance of our industry to the economic development of the country as a whole.

Our business in its detail is fundamentally technical, and our customers and the public at large consider us a highly developed technical industry. We are recognized, however, as such an essential part of modern life that the public has ceased to consider our business as mysterious or wonderful and has accepted electricity and all its blessings as an ever-present necessity and convenience. Improvements in the service and increased utilization have put the public in a frame of mind where these are accepted and expected. This attitude is partly due to the development of our industry and to the continual and unfailing improvements which have characterized its growth, but is probably due as much to the general change in the attitude of the public toward the every-day use of agencies whose technical detail it does not understand and does not care to understand so long as the beneficial results are evident. The commonplace has so far surpassed the imagination of Jules Verne that the man on the street is ready for anything.

The evident rôle and responsibility of the engineer in our industry have been in the design, in the construction and in the operation of the physical plant which produces and distributes our product. He has been responsible for the technical detail which establishes the investment in physical plant as well as for the expense of production and distribution—all items of the greatest importance, first, because of the high ratio of invested capital to income in our industry, and, second, because of the influence of these operating costs on customers' rates and hence on the success of our business. The quality of the service rendered, at least with regard to continuity, voltage, etc., is also a technical problem, so that the engineer's work has quite directly had an influence on public relations.

As our industry develops, as our service expands in its present fields and extends into new, the technical details involved and the problems to be met are bound to increase rather than to diminish both in number and importance. Engineers will be needed who not only possess high technical qualifications but who are blessed with ambition and imagination as well—men who are trained to analyze and to think straight. The work of the engineer, which has already passed from purely technical problems to those including cost, must take in those broader economic problems which include human welfare, human reactions, human progress and the other hundred and one truly economic problems which are all-important but difficult of description or analysis. The routine technical problems are continuing in increasing numbers and detail, but, in addition, economic problems are being brought in which cannot be divorced from the technical consideration. The work of the committees of the national and geographic sections shows this very clearly.

New water and steam characteristics

Under present boiler-operating conditions water and steam develop new characteristics never encountered under lower pressures and temperatures. Metals used in the construction of boilers are attacked by the water under high-pressure conditions. Even the glass, which is commonly supposed to be impervious, is affected seriously by the water and steam. The purity of the water in the steam cycle of the modern power station surpasses any commercial conception. This is essential to proper

and safe operation if high rates of heat transfer are to be maintained. Even the water used for condensing purposes must in many cases be chemically treated to get the best results from condensing equipment and from the prime movers.

The burning of fuel—one of the oldest of the arts—is continually developing new problems requiring highly specialized treatment. In addition, the relation of fuels either with regard to each other or in relation to other forms of power presents new problems. The advent of large quantities of natural gas in a region previously devoid of fuels but rich in water power may change the economic set-up of power production over night, or the change from one fuel to another may change power station design.

Studies in plant construction with a view to reducing investment costs by simplification of design and by the use of increasingly large units are carried on continually. The station with one turbine and one boiler has become a reality. While stations of this type have not been built in the larger sizes, they are already under consideration as boilers are now in operation which deliver more than a million pounds of steam per hour, more than enough for a 100,000-kw. unit. The design of generating units is being simplified, and we are now able to get single-shaft turbine units with capacities approaching 200,000 kva.

Consideration is being given to the reduction or elimination in some degree of expensive building structures as it is thought that herein may lie some possibility of reducing plant costs further. New heat cycles are being considered with a view to increasing over-all plant efficiency.

The co-operation of the electricity supply companies and large industries using power and also requiring heat in the form of steam or water for carrying on their manufacturing processes or for conducting their regular business has already become an economic necessity. These problems can generally be worked out to the mutual advantage of all parties concerned. In some cases the mutual problem may be difficult to solve, but study and the analysis of each case should give the proper solution.

New problems in design and operation

In the design and operation of electrical equipment for generation and distribution the engineers are encountering countless new problems. Insulation of all kinds is the subject of continual research, whether it be oil, compound, paper, rubber, porcelain or something else. Higher generating and transmission voltages as well present new problems—the construction of transmission lines so that they will be free from interruptions from internal or external causes. Here again the engineer has encountered metallurgical problems. The embrittlement of steel in towers, the stretching of lead sheaths on underground cable, as well as studies of the conductors themselves, are some of these. In some sections of the country wood preservation and the destructive ravages of insects or even birds have called for special study.

Standardization of equipment is receiving considerable attention, and joint committees with the manufacturers' representatives are working on this subject with a view to reducing cost by this means. The perfection of detail and the development of new equipment to meet the conditions continually arising as the art of electricity supply improves are receiving considerable attention, and service standards are being raised.

Construction and operation of transmission lines and their protection from lightning and other natural causes are receiving their share of attention as the distances over which we convey our product, as well as the amount of power, are constantly increasing. The research which has been carried on for some time on the effect of sleet and wind on overhead structures is bearing fruit.

As our systems grow and spread over the country our contacts with other organizations and industries increase and we find an increasing number of mutual problems which must be worked out with these neighbor organizations. In one case it may be the telephone and telegraph interests, in another the railoads, in another the air transport companies, in another government organizations and agencies—all in increasing numbers. These contacts are nearly always fundamentally technical, and the engineers in our organizations are put to it to see that not only are amicable relations maintained but that our rights and interests are properly safeguarded. This requires not only technical skill and knowledge, but diplomatic handling of subjects and the personal element as well.

Fixed charges relatively high

The customer and those not acquainted with the intricate details of our business cannot understand why the generating cost of energy is not all-important. They forget that in the present day the production of energy is one of the most highly developed forms of mass production known; hence the operating costs are low and the fixed charges, because of the high machinery and property costs, are unusually large in proportion. Operating costs for distribution are not unusually high, though fixed charges in connection with this equipment also are relatively large. These factors, however, do not cover the cost of electric service to the customer as he and we understand it and cannot, of course, include all of the commercial costs such as meter reading, billing and the other hundred and one services which are continually rendered. It is with these costs, however, that the engineer has been chiefly concerned.

While there will, of course, be considerable improvement and further reductions in these costs, the increments will be relatively small, and it is in higher load factor and increased utilization that we must look for the greatest possibilities in the reduction of costs. More scientific and industrial research must be devoted to the utilization of our product if we are to continue to enjoy the progress which we have enjoyed in the past, merit public good will and fill our economic position.

It is easily seen that the work of the engineers in our industry has spread from purely technical matters to questions of broad economics and economic policy. For years we have taught our young engineers that no problem was completed when the answer had been obtained in technical terms or values; they must go farther and get the final answer in dollars and cents. Now engineering goes even farther and considers the economic effect of practical application. Engineering is much more than the application of scientific discoveries and principles to practical use. Unless the utilization of the forces and resources of nature is so effected that economic conditions are improved and something has been added to man's happiness, health and prosperity, the engineer is not doing his job.

Men of the Industry

H. Grenacher Directs Operations of Minneapolis Utility

HENRY GRENACHER, who has been associated with the Northern States Power Company, Minneapolis, for the past six years, has been elected vice-president in charge of operation of that company. He was born in Zurich, Switzerland, in 1878 and after attending various schools in Switzerland was finally graduated from the polytechnic university at Zurich.

In 1902 Mr. Grenacher came to the United States and entered the employ of the United States Steel Corporation as an engineer, remaining with that company for nearly four years. The next several years he was in the cement business, and in 1909 he joined the Byllesby organization. For a number of years his engineering activities were varied, sometimes prospecting, sometimes in the operating department, sometimes investigating purchase of new properties and sometimes in the construction end. He finally became assistant to Halford Erickson, vice-president in charge of operation Byllesby Engineering & Management Corporation.

On December 1, 1925, Mr. Grenacher went to Minneapolis to take charge of the operating department of Northern States Power Company.

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JOHN A. DARLING, assistant chief system operator Edison Electric Illuminating Company of Boston, has been elected chairman of the System Operators' Association of New England. The thirtieth anniversary of Mr. Darling's connection with the Boston company was recently observed at a complimentary dinner at the Hotel Brunswick, Boston, attended by 150 friends and associates. In addition to the 30-year service pin of the Edison company Mr. Darling was the recipient of a Telechron clock with Westminster and Canterbury chimes.

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R. S. Nelson Heads Baton Rouge Utility

ROY S. NELSON, formerly general manager of the electric department of the Virginia Electric & Power Company, having supervision over the Richmond division, has recently been named president of the Baton Rouge (La.) Electric Company. Mr. Nelson has been connected with the Stone & Webster organization for some sixteen years and in the course of that time he has been identified with the Jamaica Public Service Company, Kingston, Jamaica; with the properties at Ponce, P. R., and at Port Arthur, Tex.

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COL. EDWARD C. ROSE of Trenton was elected a director of the Public Service Corporation of New Jersey to fill the unexpired term of David Baird, Jr., who recently resigned. Colonel Rose is president of the First-Mechanics National Bank of Trenton.

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D. E. KARN, formerly district manager at Kalamazoo for the Consumers Power Company, has been appointed assistant general manager of that company. Mr. Karn entered the public utility industry in 1915 as an employee of the Central Illinois Light Company with headquarters in Peoria. The following year he was transferred to the Consumers Power Company as superintendent of the steam-heating department at Grand Rapids, remaining in that position until he was transferred to Jackson in 1919 to handle work in the rate department of Hodenpyl, Hardy & Company. In 1922 he was named assistant to the general manager. Two years later he succeeded F. W. Hoover in charge of the securities department of Commonwealth Power Corporation, in which position he had the title of vice-president in all of the companies in the Commonwealth group. He returned to the Consumers organization in 1927, succeeding the late F. W. Blowers as district manager at Kalamazoo.

C. L. Proctor New President of East Central Division

CARROLL L. PROCTOR, recently elected president of the East Central Division, National Electric Light Association, is a native of Virginia and a graduate of Virginia Polytechnic Institute. After five years in the testing, foreign and railway departments of the General Electric Company Mr. Proctor became general superintendent and purchasing

agent of the Athens (Ga.) Railway & Electric Company. He then became sales manager of the Empire District Electric Company at Joplin, Mo., whence he moved to the vice-presidency of the Danbury and Bethel Gas & Electric Company at Danbury, Conn. In 1919 he returned to Joplin as vice-president and general manager of the Empire District Electric Company. He remained in that position until 1925, at which time he assumed his present position as vice-president and general manager of the Toledo Edison Company. He also holds the same position in the Lake Shore Power Company and the Toledo and Indiana Railroad Company.

Mr. Proctor has been active in association work. He was at one time president of the Missouri Public Utilities Association and served on the executive committees of the Oklahoma Utilities Association, the Kansas Utilities Association and the Midwest and Southwestern Divisions, N.E.L.A.

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L. V. NELSON has been appointed power supervisor for the Union Electric Light & Power Company, St. Louis.

Financial and Statistical News

THE behavior of the stock market this week suggests a further degree of long-pull buying of common stocks. Temporary displacement of the bears has brought utility common stock yields back close to a 5 per cent basis. While the majority moved upward, stocks like Detroit Edison and Commonwealth Edison moved against the trend, the latter to the extent of over 30 points.

——HIGH-GRADE MORTGAGE BONDS OF THE PUBLIC UTILITIES made further gains this week as the general list showed strength. This is the off week in new financing, which seems to go by spurts this year.

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Says State Cannot Revoke Security Permits

AUTHORITY OF THE Public Service Commission to revoke authorizations for the issue of securities after the sale has once been approved has been challenged by New York State companies. Representatives of Niagara Hudson Power Corporation and Associated Gas & Electric Company, R. J. Le Boeuf, Jr., and Edward Naylon, respectively, appeared at a hearing in Albany to oppose any change.

A decision was recently made whereby utilities would be ordered to show cause why unexercised authority to issue securities should not be rescinded by the commission. Public hearings were arranged in New York, Buffalo and Albany. It was the contention of the companies at these hearings that the commission's jurisdiction over financing ended once the authority to issue certain securities has been granted.

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Fifteen-Mile Falls Cost Close to Estimates

THE FINAL CHECK-UP of the cost of constructing the new 215,000-hp. Fifteen-Mile Falls hydro-electric plant of the New England Power Association, a subsidiary of the International Hydro-Electric System, shows that the total cost was within one-half of 1 per cent of the preliminary estimate made before work was begun, two years before the completion of the plant. Although many unanticipated difficulties were encountered during construction, such as ice jams during the first winter and the premature closing of a by-pass through the fall of a water gate, they were offset by economies in other directions, chiefly in the erection of the 126-mile, 220,000-volt transmission line connecting the Fifteen-Mile Falls plant with the Tewksbury, Mass., substation of the association.

The necessity for an accurate estimate of ultimate cost is indicated by the fact that the New England Power Association's long-term contract with the Edison Electric Illuminating Company of Boston for about one-half the output of the Fifteen-Mile Falls plant was negotiated on the basis of the preliminary estimates. The schedule of construction duplicated the record established on final cost, for the plant went into operation exactly on time.

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NEW CAPITAL ISSUES

One-year 3 per cent gold notes of the Staten Island Edison Corporation have been offered to the amount of $7,500,000, the price being 100 and accrued interest. Proceeds will be used to repay advances heretofore made to the corporation from time to time for new construction and for other corporate purposes.

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New Bedford Gas & Edison Light Company made an offering of 3 per cent gold notes, priced at 100 and interest, a piece of financing involving a total of $4,500,000. Proceeds will be applied toward the retirement of the entire mortgage debt and the coupon notes of the company now outstanding.

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Analyzes Invested Capital of Electrical Industry

NUMEROUS interesting ratios and comparisons relating to the power and light industry have been developed by a recently issued University of Illinois study called "The Financial Plan of Electric Light and Power Companies." A number of special analyses cover the period 1920 to 1926.

In general, the investments of fixed capital are relatively greater for hydro-electric than for fuel-electric companies. A $10,000,000 hydro-electric company, for example, would have about $9,180,000, or 91.8 per cent of its capital, invested in fixed capital such as plant, dams, equipment, etc., whereas a fuel-electric company of like size would have fixed assets of $8,750,000, or 87.5 per cent of its capital. Among the asset investments a significant difference is to be noted in the portion of capital employed in current assets. The typical fuel-electric company had 0.073 of total assets in the form of current assets compared with 0.044 for the typical hydro-electric company. Other assets, such as discount, prepaid insurance, etc., constituted approximately the same proportions of the total capital of the fuel- and the hydro-electric companies, namely, 0.026 and 0.023. Little change occurred in the asset investments between 1920 and 1926.

The sources of investment capital of the fuel- and the hydro-electric companies generally vary more than do the investments in capital assets. About nine out of ten companies of each type secure part of their capital by borrowing on long term. The typical fuel-electric company secures 36 cents, while the typical hydro-electric company obtains 41 cents of each dollar of capital in this manner. The fuel-electric companies curtailed their relative use of long-term obligations from 1920 to 1926, whereas the hydro-electric concerns increased their use of this source of capital during the period studied.

Current debts, which are small in relation to total assets, provided capital to the extent of 0.053 and 0.023 of total assets for the fuel- and the hydro-electric companies, respectively, these relationships being comparable with the relative sizes of the current assets to total assets ratios of each type of company. Both types of concerns decreased their use of short-term capital between 1920 and 1926.

In the use of stockholders' capital it was found that 56 per cent of the fuel-

electric and 72 per cent of the hydro-electric companies issue non-voting stock. Furthermore, non-voting stock amounted to 0.141 of the total assets of the typical hydro-electric company and only 0.108 of the total assets of the typical fuel-electric company. From 1920 to 1926 the use of non-voting stocks continued to increase in the case of hydro-electric companies, but remained practically constant in fuel-electric financial plans.

The increased use of non-voting stock by hydro-electric companies was largely offset by a reduction in voting stock from 0.363 of the total assets in 1920 to 0.267 in 1926. Over the period of years 1920 to 1926 the voting stocks accounted for 25 cents of each dollar of capital for the typical fuel-electric company and 30 cents for the typical hydro-electric company.

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NEWS BRIEFS

Listing of 57,879 additional shares of common stock of the American Power & Light Company has been authorized recently by the New York Stock Exchange, on official notice of issuance and distribution in payment of a stock dividend, and 12,180 shares of its $5 preferred stock, series A, on official notice of issuance in connection with the acquisition of properties, making the total amounts applied for 3,057,836 shares of common stock and 625,237 shares of $5 preferred stock, series A.

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Engineers Public Service Company declared a quarterly dividend of 50 cents per share on the common stock, payable July 1 to holders of record June 16. This compares with quarterly distributions of 60 cents per share made on this issue from July 1, 1930, to and including April 1, 1931.

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Directors of Central and South West Utilities Company have declared on each share of common stock outstanding at the close of business June 30, 1931, a dividend of 1¾ per cent payable in common stock (being at the rate of 7/400 of a share) on July 15, 1931, to holders of said stock on the books of the company at the close of business June 30, 1931.

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Certain outstanding 6 per cent sinking fund gold debenture bonds, series A, of the Louisville Gas & Electric Company have been called for payment June 1 at 102 and interest.

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All of the outstanding first mortgage 5 per cent gold bonds of the New Jersey Power & Light Company, series 1956, have been called for payment August 1 at 105 and interest.

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Chase Securities Corporation, investment affiliate of the Chase National Bank, and Harris, Forbes & Company, investment banking house, control of which was obtained by the Chase organization last summer, are to be merged on or before July 1 into a new company to be known as the Chase-Harris, Forbes Corporation. The new organization will conduct the securities-distributing business hitherto done by the two companies separately.

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Announcement has been made that Atlas Utilities Corporation, through an exchange of assets of Power & Light Securities Corporation, of which it acquired control this year, has assumed a dominant interest in the General Empire Corporation, a general management trust with $2,500,000 net assets.

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34,263,944 Kw. in Public Utility Plants

PUBLIC UTILITY POWER PLANTS increased in rating by about 2,310,000 kw. during 1930, according to a recent report by the United States Geological Survey.

The rating as of January 1 are three consecutive years was as follows:

1929 .....29,629,702 kw.
1930 .....31,952,396 kw.
1931 .....34,263,944 kw.

These totals include electric railway, Bureau of Reclamation and certain manufacturing plants in so far as these contribute to the public supply of energy, as well as central stations for light and power. The aggregate rating of the last-named group in January, 1931, was 31,976,138 kw.

The accompanying table gives the classification by type of prime mover and by geographical divisions.

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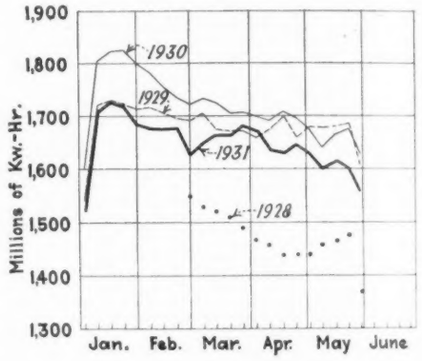
Weekly Energy Output

OUTPUT OF ELECTRIC light and power companies in the United States, as estimated by the statistical research department of the National Electric Light



Association, is shown in the accompanying chart. For recent weeks and correspondingly in preceding years the energy generated was:

	Millions of Kw.-Hr.			
Week Ended	1931	1930	1929	1928
May 9	1,600	1,640	1,677	1,460
May 16	1,614	1,669	1,680	1,470
May 23	1,600	1,673	1,637	1,480
May 30	1,565	1,627	1,606	1,370
June, 6	1,562	1,608	1,653	1,480

All years listed show the dip due to Memorial Day and the earlier two a recovery, but the current year's decline was smaller than the others. In part, at least, this smaller decrease was due to the fact that the holiday came on a Saturday, causing the loss of only half a day in some industries and no time at all in those running on a weekly schedule of five days or less.

Capacity of Generators in Power Plants Generating Electricity for Public Use, January, 1931

(U. S. Geological Survey)

				Generator Capacity of Plants Operated by										
											Combination of Two or More of Others			
			Total	Water Power		Steam Power		Internal Combustion Engines			Total	Water	Steam	Int. Comb.
Division	Companies	Plants	Capacity, Kw.	No.	Kw.	No.	Kw.	No.	Kw.	No.	Kw.	Power	Power	Engines
United States	1,609	3,904	34,263,944	1,335	8,799,135	1,495	24,205,555	793	330,258	281	928,996	276,743	562,803	89,450
New England	151	334	2,927,516	216	778,154	82	2,014,020	6	4,082	30	131,260	20,581	108,860	1,819
Middle Atlantic	161	426	8,483,871	196	1,218,527	183	7,076,500	20	19,137	27	169,707	125,295	41,970	2,442
East North Central	321	690	7,991,890	257	583,746	359	7,175,596	32	18,205	42	214,343	20,692	186,533	7,118
West North Central	367	733	2,394,294	106	323,495	284	1,842,315	273	105,095	70	123,389	12,061	83,733	27,595
South Atlantic	180	468	4,294,267	154	1,828,966	187	2,275,212	98	41,881	29	148,208	60,039	82,349	5,820
East South Central	78	215	1,638,810	34	880,185	96	693,957	70	18,885	15	45,783	23,615	19,402	2,766
West South Central	137	434	1,591,557	14	18,070	153	1,421,446	241	99,644	26	52,397	1,080	31,979	19,338
Mountain	134	314	1,144,507	158	775,856	84	315,962	42	15,961	30	36,728	9,220	6,247	21,261
Pacific	80	290	3,797,232	200	2,392,136	67	1,390,547	11	7,368	12	7,181	4,160	1,730	1,291

Great Western Power to Liquidate

DIRECTORS OF THE Great Western Power Company of California have authorized proceedings for the liquidation of the company's affairs and the conveyance of its properties to the Pacific Gas & Electric Company, which now owns more than 98 per cent of its total outstanding stock.

The preferred stocks of the Great Western Power Company at the close of 1930 were held by 10,651 investors. The holdings of more than 10,000 of these have been converted into preferred stock of the Pacific Gas & Electric Company in accordance with the offer made by the latter in January, 1931.

This exchange offer expired on April 30, but has been extended to June 15, 1931, to give to the few remaining holders of Great Western stock a final opportunity to effect the suggested exchange. On the basis of current market quotations, the two shares of the Pacific company's 5½ per cent first preferred stock and the two shares of its 6 per cent first preferred stock exchangeable for each share of Great Western preferred have an aggregate value of about $108.

The transfer of the Great Western Company's properties to the Pacific Gas & Electric Company will probably be consummated within the next few months. Aside from the simplification of the capital structure, made possible by the retirement of the Great Western stock, the refunding operations conducted by the Pacific company since acquiring control will result in reducing from eleven to not more than three the number of outstanding bond issues.

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CURRENT EARNINGS REPORTS OF ELECTRIC LIGHT AND POWER COMPANIES

Operating Companies

	1931	1930	Per Cent Increase	Operating Ratio 1931	Operating Ratio 1930
Alabama Power & subs. (Year ended April 30)					
Gross earnings	$17,931,073	$18,083,952	— 8.5	43	40
Net earnings	10,333,398	10,809,340	— 4.4	..	..
Arkansas Power & Light (Year ended March 31)					
Gross earnings	8,669,232	8,602,890	1.0	55	52
Net earnings	3,946,787	4,126,807	— 4.0	..	..
Blackstone Valley Gas & Electric & subs. (Year ended April 30)					
Gross earnings	6,347,657	6,586,919	— 3.6	57	59
Net earnings	2,702,370	2,724,400	— 0.8	..	..
Central Arizona Light & Power (Year ended March 31)					
Gross earnings	3,242,804	3,089,721	5.0	54	60
Net earnings	1,495,245	1,228,511	22.0	..	..
Consumers' Power (Year ended April 30)					
Gross earnings	32,032,565	33,329,533	— 3.9	44	48
Net earnings	18,021,502	17,259,983	4.4	..	..
Dallas Power & Light (Year ended March 31)					
Gross earnings	5,408,470	5,202,082	4.0	48	46
Net earnings	2,792,610	2,791,078	0.0	..	..
Detroit Edison Year ended April 30)					
Gross earnings	51,809,188	56,374,386	— 8.1	67	67
Net earnings	16,899,311	18,799,737	—10.2	..	..
Eastern Texas Electric & constituent cos. (Year ended April 30)					
Gross earnings	10,012,238	9,993,977	0.2	..	..
Net earnings	3,830,617	4,198,841	— 8.8	..	..
Florida Power & Light (Year ended March 31)					
Gross earnings	11,628,243	11,480,764	1.0	51	52
Net earnings	5,673,835	5,490,546	3.0	..	..
Georgia Power & subs.* (Year ended April 30)					
Gross earnings	25,954,721	26,762,077	— 3.0	50	47
Net earnings	12,919,422	14,125,932	— 8.5	..	..
Gulf States Utilities (Year ended April 30)					
Gross earnings	6,976,276	6,920,674	0.8	..	..
Net earnings	2,894,831	3,144,030	— 7.9	..	..
Houston Lighting & Power (Year ended March 31)					
Gross earnings	8,750,666	8,238,017	6.0	52	52
Net earnings	4,228,231	3,982,911	6.0	..	..
Kansas City Power & Light (Year ended April 30)					
Gross earnings	14,813,015	14,656,749	1.6	47	50
Net earnings	7,815,515	7,341,370	6.5	..	..
Louisana Power & Light (Year ended March 31)					
Gross earnings	6,265,862	5,481,512	14.0	51	52
Net earnings	3,047,735	2,626,736	16.0	..	..
Memphis Power & Light (Year ended March 31)					
Gross earnings	6,917,098	6,497,493	6.0	59	60
Net earnings	2,821,539	2,585,304	9.0	..	..
Minnesota Power & Light (Year ended March 31)					
Gross earnings	6,499,333	6,295,102	3.0	37	38
Net earnings	4,101,704	3,878,951	6.0	..	..
Nebraska Power (Year ended March 31)					
Gross earnings	6,720,214	6,110,776	10.0	48	50
Net earnings	3,449,860	3,037,515	14.0	..	..
Nevada- California Electric & subs. (Year ended April 30)					
Gross earnings	5,682,299	5,737,552	— 0.9	52	52
Net earnings	2,938,073	2,971,881	— 1.1	..	..
New Orleans Public Service (Year ended March 31)					
Gross earnings	17,793,040	16,132,974	10.0	65	64
Net earnings	5,357,323	5,823,624	9.0	..	..
Ohio Edison (Year ended April 30)					
Gross earnings	19,026,513	19,480,177	— 2.3	39	42
Net earnings	11,674,863	11,298,069	3.3	..	..
Pacific Power & Light (Year ended March 31)					
Gross earnings	4,512,348	4,722,937	— 4.0	52	50
Ner earnings	2,143,503	2,331,790	— 8.0	..	..
Penn Central Light & Power (Year ended March 31)					
Gross earnings	5,772,747	5,939,029	— 2.8	..	..
Net earnings	3,536,721	3,406,543	3.8	..	..
Puget Sound Power & Light (Year ended April 30)					
Gross earnings	16,678,422	16,791,355	— 0.7	..	..
Net earnings	7,258,207	7,105,721	2.1	..	..
Southern California Edison (Year ended April 30)					
Gross earnings	41,420,357	40,722,533	2.0	32	33
Net earnings	28,369,394	27,229,594	4.0	....	..
Tenessee Electric Power & subs. (Year ended April 30)					
Gross earnings	14,244,744	15,198,889	— 6.3	52	51
Net earnings	6,755,235	7,496,025	— 9.9	..	..
Texas Power & Light (Year ended March 31)					
Gross earnings	9,941,425	9,855,066	1.0	49	51
Net earnings	5,012,753	4,841,223	4.0	..	..
Virginia Electric & Power (Year ended April 30)					
Gross earnings	17,096,571	17,142,115	— 0.3	..	..
Net earnings	7,707,965	7,772,508	— 0.8	..	..

Holding Companies

	1931	1930	Per Cent Increase	Operating Ratio 1931	Operating Ratio 1930
American Water Works & Electric & subs. (Year ended April 30)					
Gross earnings	52,839,076	54,849,143	— 3.7	52	50
Net earnings	25,529,198	27,297,365	— 6.5	..	..
Associated Gas & Electric (Year ended April 30)					
Gross earnings	111,656,891	103,846,695	8.0	58	55
Net earnings	46,963,321	46,907,026	0.1	..	..
Cities Service (Year ended April 30)					
Gross earnings	53,715,818	52,650,042	2.0	..	..
Net earnings	51,028,627	51,071,832	— 0.0	..	..
Columbia Gas & Electric & subs. (Year ended March 31)					
Gross earnings	94,299,791	100,352,031	— 6.0	58	56
Net earnings	39,239,545	44,269,663	—11.3	..	..
Commonwealth & Southern & subs. (Year ended April 30)					
Gross earnings	137,444,281	147,383,426	— 6.7	48	49
Net earnings	71,291,215	75,344,026	— 5.4	..	..
Eastern Utilities Associates & constituent cos. (Year ended April 30)					
Gross earnings	9,164,563	9,382,699	— 2.3	58	60
Net earnings	3,801,263	3,781,914	0.5	..	..
Engineers' Public Service & constituent cos. (Year ended April 30)					
Gross earnings	52,935,516	51,634,177	2.5	57	55
Net earnings	22,699,514	22,274,587	1.9	..	..
Federal Light & Traction & subs. (Year ended April 30)					
Gross earnings	8,348,735	8,450,356	— 1.2	57	57
Net earnings	3,581,440	3,588,859	— 0.2	..	..
North American Light & Power (Year ended March 31)					
Gross earnings	47,054,505	46,343,518	1.5	54	55
Net earnings	21,465,281	20,885,019	2.8	..	..
Public Service Corp. of N. J. & subs.† (Year ended April 30)					
Gross earnings	139,209,798	138,876,580	0.2	68	70
Net earnings	44,703,253	42,862,568	4.3	..	..

*Operations of Columbus Electric & Power acquired May 1, 1930 are included for all periods.

†Operating expenses include depreciation.

Business News and Markets

Fear Amendment May Impede Free Sale of Equipment

WHILE an amendment to the personal property law of New York State which became effective January 1, 1931, will probably improve the position of sellers of equipment in repossession cases, danger is felt that it may place an obstacle in the way of the free sale of such equipment. To give greater protection to installment sellers, this amendment provides that a conditional bill of sale must contain a description of real property where equipment is installed as well as the name of the owner. The term owner is defined as "the record owner in fee as shown by last recorded conveyance."

Previously, the seller of equipment such as elevators, heaters, refrigerators, oil burners, etc., for installation in a building, when installment terms of payment were demanded by the purchaser, would simply have a conditional bill of sale executed. This could be filed in the county clerk's office without becoming a lien of record against the real property. In case of default the seller generally would repossess. Frequently, however, a building containing hypothecated equipment changed hands without the new owner being aware of the existing lien until removal was threatened due to default of payments. Then the new owner either carried on with the remaining payments or found his building temporarily without elevators, heat or refrigeration.

Owners default

Where such equipment had seen extensive service or had become obsolete, owners frequently decided to default, to permit repossession by the seller, and then contract for new installations. The original seller thus would not only sustain the loss of the unpaid balance, but had to pay the cost of removal, scrapping due to obsolescence or reconditioning or resale and the loss of possible customers for new equipment.

Since 1929 the diverse methods of unscrupulous builders or owners designed to create high valuations for their property have been exposed. Some mortgage and title companies now withhold final payment to the builder until he can show a clean bill of health for all equipment he may have contracted to purchase on installments. Where this is not possible they demand subordination of the seller's rights in such equipment, thereby leaving him practically without security. Reliable sellers must thus assume great risks or forego the opportunity to make large sales. Many sales thus fall to inexperienced sellers who subordinate all claims, merely trusting to be able to collect finally. Large orders have recently been switched to these little-known manufacturers.

Manufacturers of equipment involved in this type of selling are uncertain as to the outlook. In many cases large volume production and sales are essential if present price schedules are to be maintained. They feel that clearly defined protection is needed in the form of an enforceable lien. If mortgage and title companies demand subordination, if sellers are to lose all chance of recovery of what at present is still considered personal property, selling prices must be substantially increased to provide a cushion for losses. Larger "down" payments will be demanded. In other ways, sales resistance will have to be increased in the interest of security, thus inevitably causing substantial shrinkage from what otherwise would be normal sales volume.

Companies specializing in installment sales are also definitely interested. They believe that increased installment selling will promote speedy recovery and that they should be allowed to proceed without undue interference.

The legal status of the situation revolves around what constitutes personal property. Texas courts have held that "Frigidaires" in an apartment retain their character as personalty—remain chattels—and that the conditional vendor could remove them "as against a prior mortgage of the building since they did not impair the security." With slight variations New York State and Florida courts have taken the same stand.

An important decision was handed down by the Supreme Judicial Court, Suffolk County, Massachusetts, March 3, 1931, which reversed a prior decision by another court and held that two compressor units and the 54 refrigerators in an apartment were not real estate, but personal property, title to which remained with the seller until full payment of purchase price "except the piping which runs through the walls and partitions."

Manufacturers and selling agents of equipment involved therefore maintain that title and mortgage companies are creating obstructions and interference with their business by methods that cannot be justified and will not be sustained in a court of law. They urge also that such interference is particularly deplorable at a time when all lines of business need the fullest support of all financial institutions.

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Electrical Merger Said to Be Ratified

DIRECTORS OF THE Allis-Chalmers Manufacturing Company are stated to have approved purchase of the assets of American Brown Boveri Electric Company, the electrical subsidiary of American Brown Boveri Electric Corporation, and the capital stock of Condit Electrical Manufacturing Company as well as the electrical patents and certain other assets of American Brown Boveri Electric Corporation.

It is understood that terms of the purchase provide for the issue of about 62,000 shares of Allis-Chalmers capital stock and the payment of $600,000.

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Anglo-Russian Electrical Agreement Signed

A TECHNICAL AGREEMENT of far-reaching importance, extending over a number of years, has recently been signed between the Soviet government and the Metropolitan-Vickers Electrical Company, Ltd., under which the latter has agreed to provide expert technical assistance in the manufacture of steam turbo-generating plant, condensing plant, heavy electrical plant, industrial motors, switchgear, etc., which are to be built in Russia in the works of the All-Union Electrotechnical Combine.

The plant manufactured will extend to the largest capacity required for the generation and distribution of electricity and it will be employed in connection with the five-year plan.

This is the second agreement covering the supply of expert technical assistance which Metropolitan-Vickers has concluded with the Soviet, the first having been in operation satisfactorily to both parties for four years.

Growth of Rigid Conduit for Electrical Wiring

FOR THE PURPOSE of inquiring into the experience which has attended the use of rigid conduit as a protective electrical raceway the Electrical Testing Laboratories of New York has prepared a critical history of the development of rigid conduit, which has just been published by the trade extension committee ofr the Rigid Conduit Section of the National Electrical Manufacturers' Association.

While an academic study of the origin of this important electrical raceway, this book has much of interest and value to architects, electrical engineers, contractors and inspectors. It reveals the various attempts to eliminate hazards that developed in the early days when slightly protected wiring was buried behind plastered walls, in damp places and in positions subject to mechanical abuse. It points out the trial and failure of pasteboard and thin wall metal tubings of various types; the attempt to use a wood-lined metal tubing and, finally, the successful employment of heavy wall mild steel conduit with suitable protective coatings which was "approved" by the first National Electrical Code in 1897 and which has been employed to the present day with practically no changes in form or characteristics.

Copies of the report may be secured by writing to George H. Sicard, secretary Rigid Conduit Section, Utica, New York.

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Survey Determines Speed of Driven Machinery

TO DETERMINE PRESENT PRACTICE in various plants and industries with respect to the speeds of driving and driven machinery a survey is being made through a questionnaire sent out by a committee on speeds of machinery working under the procedure of the American Standards Association.

The purpose of the committee is outlined in the following program, tentatively adopted at the organization meeting of the committee. The information gained from the questionnaires will form the basis for the development of the proposed program. It comprises the establishment of:

1. A series of standard speeds of transmission shafting and driven machines, to be based on a standard series of speeds of driving machines (particularly electric motors).
2. A series of standard diameters of pulleys and of the pitch circles of gears and chain sprockets, resulting in a series of standard transmission ratios.
3. A series of standard widths of pulleys and of belts of different kinds, and a standard pull per inch of width for belts of each kind.
4. A standard series of belt speeds.
5. Tables of:

(a) The power to be transmitted by the maximum permissible torque in shafts of the different standard diameters at different standard shaft speeds.

(b) The power to be transmitted per inch of belt width, by belts of a definite kind of material and construction, for different standard shaft speeds and different standard pulley diameters.

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National Gypsum Orders Electric Locomotive

AN ORDER FOR A STANDARD 8-ton, trolley type, electric locomotive has been received by the Westinghouse Electric & Manufacturing Company from the National Gypsum Company. This order follows the contract for electric line and substation equipment recently closed with Westinghouse and it will be the first locomotive purchased in the electrification program of the Gypsum company.

It will be equipped with two 40-hp. motors, operating from a 250-volt trolley, and will be of the single-end type. Dynamic braking, drum control equipment and type M edge-wound resistors are other features of the specifications.

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Underground Cable Plows Available for Rent

BY MEANS OF A special plow built by the General Electric Company and available for rental purposes parkway or underground cable can be installed beneath sod and in locations where a minimum disturbance to the ground is desired. A reel of parkway cable is located at one end of the circuit run, mounted on supports so that it may unreel easily. The plow is connected to a tractor and one end of the parkway cable is connected to the plow blade. The blade is started in the ground and, by reason of the nature of the blade point, there is opened a hole of sufficient diameter to permit the cable to be dragged through it. The surface of the earth is not disturbed except to the extent of the width of the plow blade.

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New York Metal Prices

	June 3, 1931 Cents per Pound	June 10, 1931 Cents per Pound
Copper, electrolytic	8	8¼
Lead, Am. S. & R. price	3.75	3.75
Antimony	6.20	6.20
Nickel, ingot	35	35
Zinc, spot	3.60	3.65
Tin, Straits	22.40	23.10
Aluminum, 99 per cent.	23.30	23.30

British Electrical Combine Has Good Year

THE RETURNS OF Associated Electrical Industries for 1930 show little variation from 1929, net income being $1,864,990, against $1,829,005. The dividend on the ordinary share capital is again 6 per cent; depreciation is provided for on the same scale as in 1929, and the appropriation to reserve is increased.

This combine was formerly the Metropolitan-Vickers Electrical Company, but is now largely a holding company controlling an important group of electrical manufacturing enterprises, and a welcome feature of its annual report is the appearance for the first time of a consolidated balance sheet, combining its own assets with those of its subsidiaries. This shows current liabilities of $18,984,365, whereas floating assets amount to $46,629,915.

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TRADE BRIEFS

Electrical Engineering Sales Company has moved its offices from 426 S. Spring Street to 417 S. Hill Street, Los Angeles.

•

Bristol Company, Waterbury, Conn., has announced the removal of its Pittsburgh office to the Koppers Building, 436 Seventh Avenue.

•

Roller-Smith Company has announced the appointment of the Commercial Engineering Company as its sales agent in the District of Columbia.

•

At a recent meeting of the board of directors of the General Refractories Company in Philadelphia, Burrows Sloan was elected chairman of the board, John R. Sproul president, E. A. McKelvy vice-president and Roger A. Hitchins secretary and treasurer.

•

Babcock & Wilcox Company acquired non-exclusive licenses from the Automatic Arc Welding Company for its automatic arc-welding patents.

•

Jeffery-Dewitt Insulator Company, Kenova, W. Va., announces the appointment of P. T. Bradley as its representative in the Philadelphia district.

•

Gordon W. Hamilton has been appointed manager of the Milwaukee office of Westinghouse Electric & Manufacturing Company, replacing D. E. Webster, who becomes special representative operating out of that office.

•

Engineering Equipment Company has changed its name to J. P. Manypenny, 217 South 24th Street, Philadelphia, Pa.

Market Conditions

WHAT equipment business there is is keenly competed for on the Pacific Coast, with very close figuring on the various contracts. Machinery orders, however, have been coming into the market in larger volume both from power companies and industrials. The Middle West and Southwest show signs of improvement.

——DULLNESS RULES IN THE EASTERN MARKET in all except government business. The large Pennsylvania Railroad locomotive order is an exception.

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EASTERN

—DULLNESS CHARACTERIZES *the electrical equipment markets in the Eastern districts, with the possible exception of government account at Washington, D. C., where bids recently have been opened for a sizable amount of apparatus of different kinds, from heavy generator units to small supply items. There are a number of important impending awards in that quarter.*

—THE PHILADELPHIA MARKET *is encouraged with the record electric locomotive contract lately placed by the Pennsylvania Railroad. New York account is spotty; central stations show little immediate promise but good future prospects, considering the greater volume of inquiries. Electric appliance sales for fall account are exhibiting signs of life, which seems to have been inspired materially by substantial price reductions from former list.*

A total of twelve bidders have submitted quotations for a generating set for the United States Engineer Office at Buffalo, N. Y., with a price range from $30,115 to $46,386, and with similar rather wide variation in connection with figures for spare parts. Award is scheduled to be made at an early date. The extreme shading of prices to secure commitments is particularly noticeable in a quota of bids received by the Department of Commerce, Washington, D. C., for steel radio towers, with thirteen bidders seeking orders for a total of 44 such structures and a price range from $296 to $928 per steel unit; the McClintic-Marshall Corporation has tendered the low figure and is expected to secure the order. Four companies have entered bids for a 25-kw. generator unit for the same department, with Westinghouse Electric & Manufacturing low at $2,000.

A New York manufacturer has secured an order for a waterwheel turbine generator unit for an installation for industrial service in northern New York, totaling $100,000. The Terry Steam Turbine Company, Hartford, Conn., is furnishing auxiliary turbine units for a central station installation in Louisiana. The Department of City Transit, Philadelphia, Pa., is proceeding with electrification work on the Ridge-Eighth-Locust Street Subway and is asking bids for contract rails until June 23. The Board of Transportation, New York, has made confirmation of an order recently given to General Electric Company for substation equipment for subway lines, totaling $2,000,000, and one of the record commitments for the year. Otis Elevator Company has submitted a low figure for electric elevators for the City Hall at Newark, N. J., at a price of $69,490; the A. B. See Elevator Company bid $86,500.

Electric Boat Company, Groton, Conn., is the successful bidder for the building of a new submarine for the United States Navy Department, at a price of $3,297,000. The vessel will be of 1,150 tons rating and is scheduled for completion in 30 months. The company will increase its working force and will soon place orders for materials and equipment.

CONSTRUCTION PROJECTS

Signal Supply Officer, Signal Corps, United States Army, Army Base, Brooklyn, N. Y., will receive bids until June 22 for generators in lots of 100 to 1,000 (Circular 168). DuPont Cellophane Company, Buffalo, N. Y., has approved final plans for addition to mill to cost close to $2,000,000. City Armory Board, New York, has plans for an armory at Jamaica, L. I., with machine shop and other mechanical departments, estimated to cost $1,700,000. Commissioner of Institutions and Agencies, Trenton, N. J., will receive bids until June 16 for a switchboard for local state prison. Union Lines Poultry Terminal, Inc., Weekawken, N. J., plans new terminal to cost $1,000,000. Pennsylvania Railroad Company, Philadelphia, Pa., has filed plans for passenger terminal to cost over $10,000,000. General Purchasing Officer, Panama Canal, Washington, D. C., will receive bids until June 26 for electric motors, blowers, rectifiers, fuses and other electrical supplies (Schedule 2362).

SOUTHWEST

—THE LARGE MANUFACTURERS *report a normal number of orders for medium-sized appartus, but they are all small. One power company ordered ten distribution transformers when ordinarily it would buy at least 50. Everything else is in about the same ratio. In the past week very few figures have been submitted for machinery above stock sizes.*

The only contract reported closed was for motors and control equipment for raising and lowering the draw span of the new railroad bridge at Booneville, Mo.; a project costing $12,000.

CONSTRUCTION PROJECTS

National Air Transport Company, Chicago, Ill., has approved plans for hangar and shops at municipal airport, Kansas City, Mo., to cost $150,000. Kansas City Southern Railroad Company, Kansas City, Mo., has plans for an addition to grain elevator to cost $120,000. Board of Public Service, St. Louis, Mo., plans power plant in connection with public market building, entire project to cost close to $125,000. Kansas City Power & Light Company, Kansas City, Mo., has plans for proposed power substation "J" to cost more than $80,000. Union Equity Cooperative Exchange, Enid, Okla., has approved plans for a grain elevator to cost about $300,000. Independent Refining Company, Mineola, Tex., has plans under way for an oil refining plant at West Mineola, to cost over $350,000.

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NEW ENGLAND

—UNSTEADINESS IN BUYING *is reported in this district and appears to indicate no definite trend in electrical equipment orders. One prominent manufacturer notes an increase in orders for small motors, one group amounting to about $5,000 and another to about $3,000. A slight betterment in sales of fractional-horsepower motors was recorded, but heavy electrical equipment business is at a low level.*

Central-station supplies are quiet, though some line materials are moving in light spurts; recently equipment for pole line work was purchased for extensions in Massachusetts. Industrial electric furnaces are attracting interest, though sales are uneven; recently a large 500-kw. annealing furnace was placed in a non-ferrous metal plant. Outside electric lighting is commanding attention and sales of glowlights and spotlights for service stations have been quite steady, including an interesting floodlighting project requiring twelve 1,000-watt lamps for a campus illumination. Merchandising is gaining in the northern districts of New England, with reported increase of about 17 per cent over last year in one month for one

group of central stations and added revenue of over $30,000 for another group of stations. Refrigerator sales are maintaining an increasing lead in interest.

CONSTRUCTION PROJECTS

Board of Trustees, Wellesley College, Wellesley, Mass., plans new science building to cost over $200,000. Goldo Branch Confectionery Company, Brighton, Boston, Mass., contemplates an expansion and improvement program to cost close to $50,000. Belchertown State School, Belchertown, Mass., plans industrial shop unit to cost about $60,000.

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MIDDLE WEST

—THE VOLUME OF BUSINESS *continues to hold up well and more favorable than unfavorable indications are being observed. The recent unfavorable financial situation will undoubtedly have some adverse effect, but all in all, a more optimistic feeling is being exhibited.*

The major activities continue to maintain their positions, with some slight recession observed in the steel industry. Reports of railroad equipment purchases, such as one for 500 box car steel frames and superstructures, are particularly encouraging at this time. Industrial activity continues quite spotty, but some picking up of general activity is noticeable with subsequent gains in employment. A larger movement of commodities is observed, one railroad entering the Chicago area reporting a substantial gain in freight-loadings as compared to a similar period last month. The production of electrical energy continutes to increase at a slow, steady rate. Retail sales are exhibiting firmness, while wholesalers report more inquiries, more customers, and more tonnage. Mail order sales for the quarter look promising. There has been a steady demand for distribution materials and a considerable amount of electrical apparatus is out on inquiry at the present time.

CONSTRUCTION PROJECTS

Michigan Electric Power Company, Bad Axe, Mich., will extend transmission lines to Vassar and other municipalities in Thumb district. J. W. Wells Lumber Company, Menominee, Mich., will carry out an expansion and improvement program at mill to cost over $150,000. Fred Friedline, Kentland, Ind., architect, is preparing plans for a grain elevator at South Chicago, Ind., to cost more than $700,000. Ohio Edison Company, Youngstown, Ohio, plans extensions in transmission lines in Center Township, following recent acquisition of system of Youngstown & Ohio Railroad Company in that district. Minneapolis, Minn., plans installation of ornamental lighting system on Nicollet Avenue. Union Pacific Railroad Company, Omaha, Neb., plans engine house and shops at Cheyenne, Wyo., to cost about $200,000.

PACIFIC COAST

—BUSINESS CONTINUES *to be fairly well distributed in moderate quantities and bitterly contested. Sales veterans state that sales conditions are altogether beyond their experience.*

—MACHINERY ORDERS *are again an outstanding feature, including power company, industrial and special business.*

Orders reported during the week include $12,000 worth of General Electric voltage regulators for Yosemite National Park, $3,000 worth of air circuit breakers for a San Francisco substation, $8,000 of spare parts for electric propulsion equipment of the new Dollar steamship "President Hoover"; several banks of small power transformers, sizes 200 to 333 kva., 60,000 volts., valued at $35,000, for central California installation; eight motor pump installations, sizes 40 to 100 hp., for Hawaiian Island installation, valued at $7,000; a $2,500 assortment of Westinghouse static condensers for power-factor correction.

Pumping business generally is improved and constructive efforts to curtail overproduction have improved the crop outlook. A manufacturer reports one $18,000 sale of motors and control equipment to a pump manufacturer. Prospective orders cover $2,500 of leaded cable, $4,000 of power crossarms and $150,000 substation equipment, all for Los Angeles. Government awards include $3,400 for a 7-mile, 33,000-volt Nevada transmission line and $45,000 for a Diesel engine and 2,300-volt d.c. generator equipment for Alaska.

Although motor and apparatus sales in the Seattle district last week were light, showing a slight decrease over the former week, some optimism was expressed because of a number of inquiries and a few orders received from lumber mills and allied woodworking plants, mainly for replacements. Orders placed included two 75-hp. motors and fifteen smaller machines to a lumber mill, 45 machines from 125 hp. down, the majority 25 and under, to mills, pulp and paper mills and miscellaneous industrials; 40 machines, from 100 hp. down, including a number of tens and fifteens, to mills, irrigation and canneries and ten from 25 hp. down to agricultural sources. The Northwest Chair Company, in Tacoma, has issued specifications for 40 motors from 15 hp. down. Other sales reported involved $1,000 worth of miscellaneous switchgear and about 25 transformers from 10 to 50 kva. The Seattle purchasing department is taking bids for twenty 7½-kwa. and five 10-kva. transformers and also for 10,000 standard locust unpainted wood pins. The park board in Tacoma is ordering equipment for floodlighting the tennis courts in the central playground. Columbia River Power Company, Stuart Building, Seattle, expects to receive a Federal Power Commission permit in August for the development of a $15,000,000 hydroelectric project on Columbia River at Cascade Rapids. Plans call for the development of 235,000 hp.

CONSTRUCTION PROJECTS

Long Beach, San Jose and Huntington Beach, Calif., plan ornamental lighting systems. National Flying Service, Ltd., San Fernando, Calif., plans airport and buildings to cost close to $100,000. Filice & Perrelli Canning Company, Gilroy, Calif., plans improvements in plant to cost more than $100,000. Superior Felt & Paper Mills, Inc., Seattle, Wash., contemplate addition to mill to cost about $200,000. United Grain Growers, Inc., Spokane, Wash., are planning construction of a grain elevator to cost over $125,000. Montana Power Company, Great Falls, Mont., plans installation of compressor stations and other operating equipment for natural gas pipe line to cost over $10,000.000.

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SOUTHEAST

—CENTRAL-STATION ACTIVITIES *were at a rather low ebb during the past week, but industrial lines looked up a bit. One of the larger central stations has asked bids on a substantial quantity of paper cable.*

A Georgia textile plant placed an order for $30,000 worth of loom motors and control equipment, while a foundry in Alabama ordered a 960-kva. capacitor costing approximately $10,000. One of the telegraph companies ordered 50,000 lb. of bare copper wire for use in Alabama and 42,000 lb. of similar material for use in Georgia. An industrial in Tennessee ordered $6,500 worth of lighting equipment and a duplicate of this order is expected to be placed very shortly. The federal penitentiary at Atlanta ordered approximately $5,000 worth of conduit cable condulets and lighting fixtures and more business from this source is in immediate prospect. One of the larger cities in west Tennessee ordered switchboard and condenser equipment amounting to $13,000 for the city pumping station. A county-owned electric generating plant in Georgia is in the market for approximately $6,000 worth of transformers, cable and supply lines for distribution expansion activities.

CONSTRUCTION PROJECTS

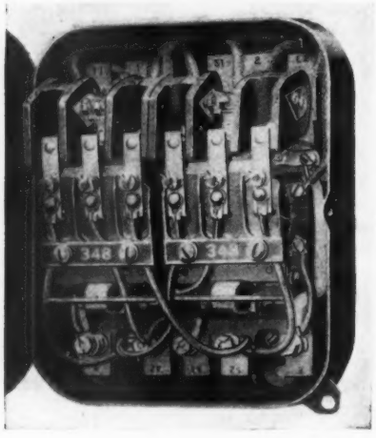
Southern Dairies, Inc., Washington, D. C., plans plant at Asheville, N. C., to cost over $100,000. Brooks Brothers Company, Inc., Philadelphia, Pa., has approved plans for a tapestry mill at Greenville, S. C., to cost over $80,000. Gaylord Container Company, Atlanta, Ga., plans addition to paper container plant to cost close to $100,000. Weiss-Patterson Lumber Company, Pensacola, Fla., plans improvements in mills to cost over $80,000.

New Equipment Available

Reversing Starter for Small A.C. and D.C. Motors

AN ACROSS-THE-LINE TYPE reversing starter for d.c. and a.c. polyphase motors up to 3 hp. has been announced by Cutler-Hammer, Inc., Milwaukee, Wis. These starters are designed for use with motors on hoists, lifts, garage doors, small machine tools and other equipment where a half-time, intermittent duty reversing starter is required.

Reversing is accomplished by means of two mechanically interlocked mag-



netic contactors which are controlled from a remote point by means of a separate push-button master station. Small size and high operating efficiency are features of this starter. Over-all size is 7⅞ in. wide x 8⅞ in. high x 4⅞ in. deep. The contactors are a new three-pole design. Silver-to-silver contacts reduce arcing and pitting to a minimum and it is stated assure maximum current-carrying capacity at all times. The magnet structure consists of a laminated frame with a shading coil for alternating current and a brass shield for direct current.

These inclosed reversing starters are furnished in two types: Type SRA is arranged for two-wire control only and has a maximum capacity of 1 hp.; type SRB can be used for either two- or three-wire remote control. Blowouts are provided to give maximum capacity of 3 hp.

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A LINE OF METAL-PLATE RECTIFIERS supplementing the small size rectifiers available for some years has been announced by the B-L Electric Manufacturing Company, St. Louis, Mo. These rectifiers are constructed entirely of metal plates without any moving parts and are of rugged construction. They are used to obtain low-voltage direct current from the ordinary alternating-current lighting or power lines and for this purpose require the use of small step-down transformers. Many applications exist for the use of such rectifiers in the fields of radio, sound-film equipment, signaling, alarms, industrial control and many others.

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Tubular Immersion Heaters for Heavy Liquids

A TUBULAR TYPE electric immersion heater for use in coating tanks containing tars, asphalts, varnishes or other inflammable liquids viscous at ordinary temperatures is announced by H. O. Swoboda, Inc., Pittsburgh, Pa. The heater is in two types, E-10 and E-21, both resembling in appearance the ordinary pipe coils commonly used with steam or other fluids to heat such tanks.

The heaters can be made for any capacity, the larger the better, the manufacturer states. A recent installation has a capacity of 100 kw. and is used in connection with a tank containing approximately 20,000 gal. of asphalt.

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Heating Unit for Glass-Annealing Lehrs

A NEW ELECTRIC HEATING UNIT for glass-annealing lehrs, designed to provide low initial and maintenance costs, correct heat distribution throughout the width and length of the lehr, flexibility of arrangement of the units in the lehr, ease of removal or replacement in either floor or roof and constant resistance and simplicity of terminal arrangement has been announced by the General Electric Company.

Most of the standard units are designed for 55-volt operation, thus allowing four to be connected in series on 220-volt circuits. One type is also provided with a 44-volt rating, allowing five to be connected in series on a 220-volt circuit. Units have lengths of either 38½ or 50¼ in. including the reinforced terminal extensions, for use in 36- or 48-in. lehrs. All widths are 7¼ in. and all heights are 3⅛ in. Kilowatt ratings are 3, 3½, 4, 6 and 7½.

High-Wattage Tubular Lamps

FOLLOWING RECENT DEMAND created by built-in lighting for higher wattage linear light sources, the Nela Park lamp development laboratories of General Electric Company and also the Westinghouse Lamp Company have announced new tubular lamps.

The former, a 100-watt T-12 bulb "Mazda" lamp, has a maximum over-all length of 34 in. and a rated life of 1,500 hours. The Westinghouse lamp is a T-10, 150-watt "Mazda" lamp, designed for a life of 1,000 hours, and can be burned on 110, 115 and 120-volt circuits. Luminous pilasters, large areas of etched glass and cove lighting installations create demand for this new high-wattage lamp, which supplements the low-wattage tubular lamps already available.

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Motor Design Embodies Footless Stator and Rotor

A DEVELOPMENT IN power-transmission and direct-motor-drive equipment known as the "Rite-Lo-Speed" motor has been announced by J. D. Christian-Engineers of San Francisco and Los Angeles. It embodies a standard footless stator and rotor and heat alloy steel helical gears. These are ball bearing mounted and arranged in a compact manner so that the entire assembly is scarcely larger than the motor itself. The motor has been developed in co-operation with the manufacturer of U. S. asbestos-protected motors. The

gear end of the assembly presents a design which is not in any way a planetary system, there being only two gears and two pinions. It is so arranged that a heavy overhung pull can be taken on the final shaft without the use of an outboard bearing, according to Mr. Christian. The oil case is sealed from the motor by a modified arrangement. The entire assembly is protected by a dirt-proof and water-proof housing.